

## Supplementary Information

### Enhanced Photocatalytic Activity for TiO<sub>2</sub>-Cu/C with Regulation and Matching of Energy Levels by Carbon and Copper on Photoreduction of CO<sub>2</sub> into CH<sub>4</sub>

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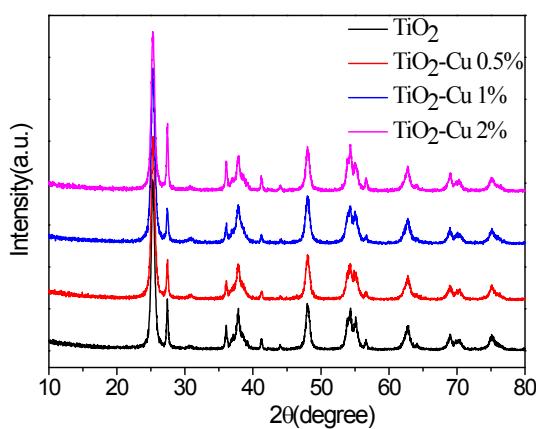


Figure S1. XRD patterns of pure TiO<sub>2</sub>, TiO<sub>2</sub>-Cu x% samples.

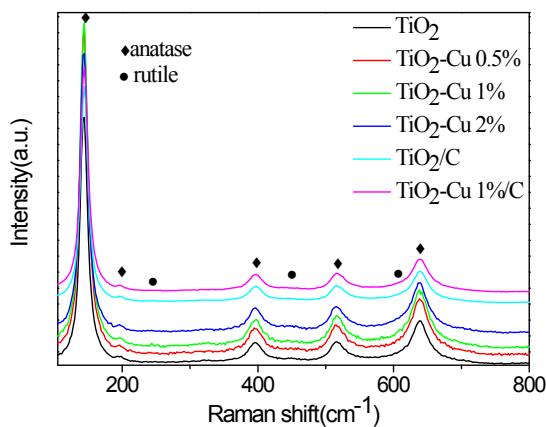


Figure S2. Raman spectra of pure TiO<sub>2</sub>, TiO<sub>2</sub>-Cu x%, TiO<sub>2</sub>/C and TiO<sub>2</sub>-Cu 1%/C samples.

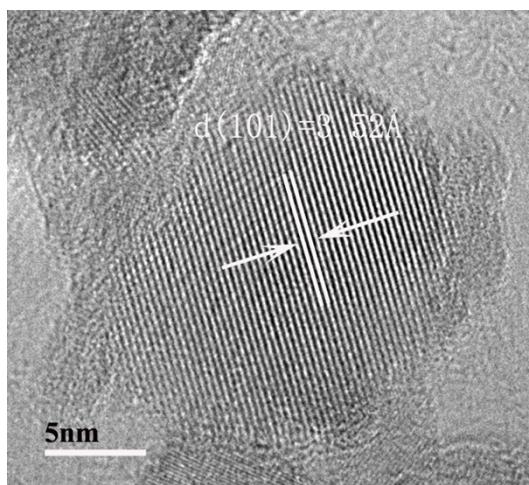
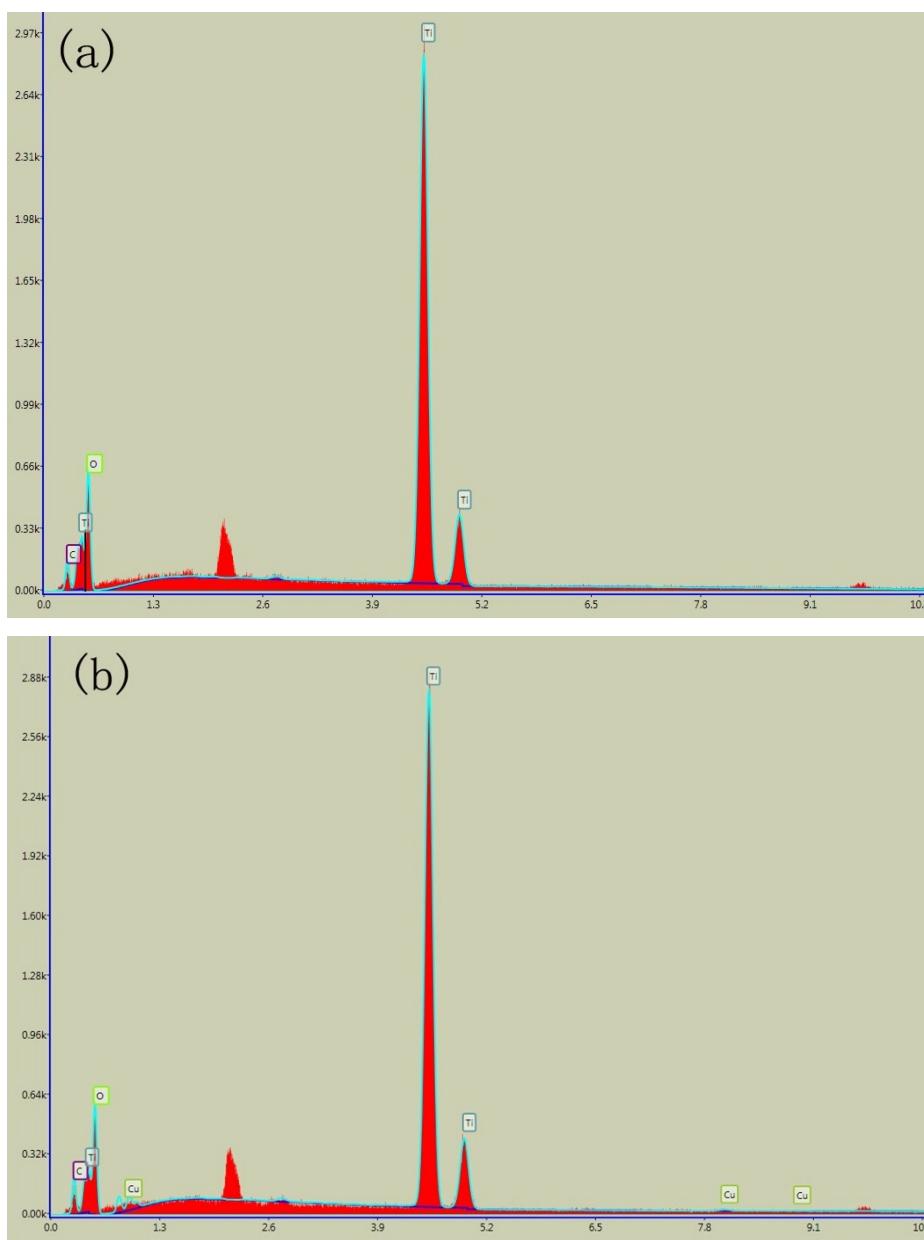


Figure S3. HRTEM image of anatase  $\text{TiO}_2$ .



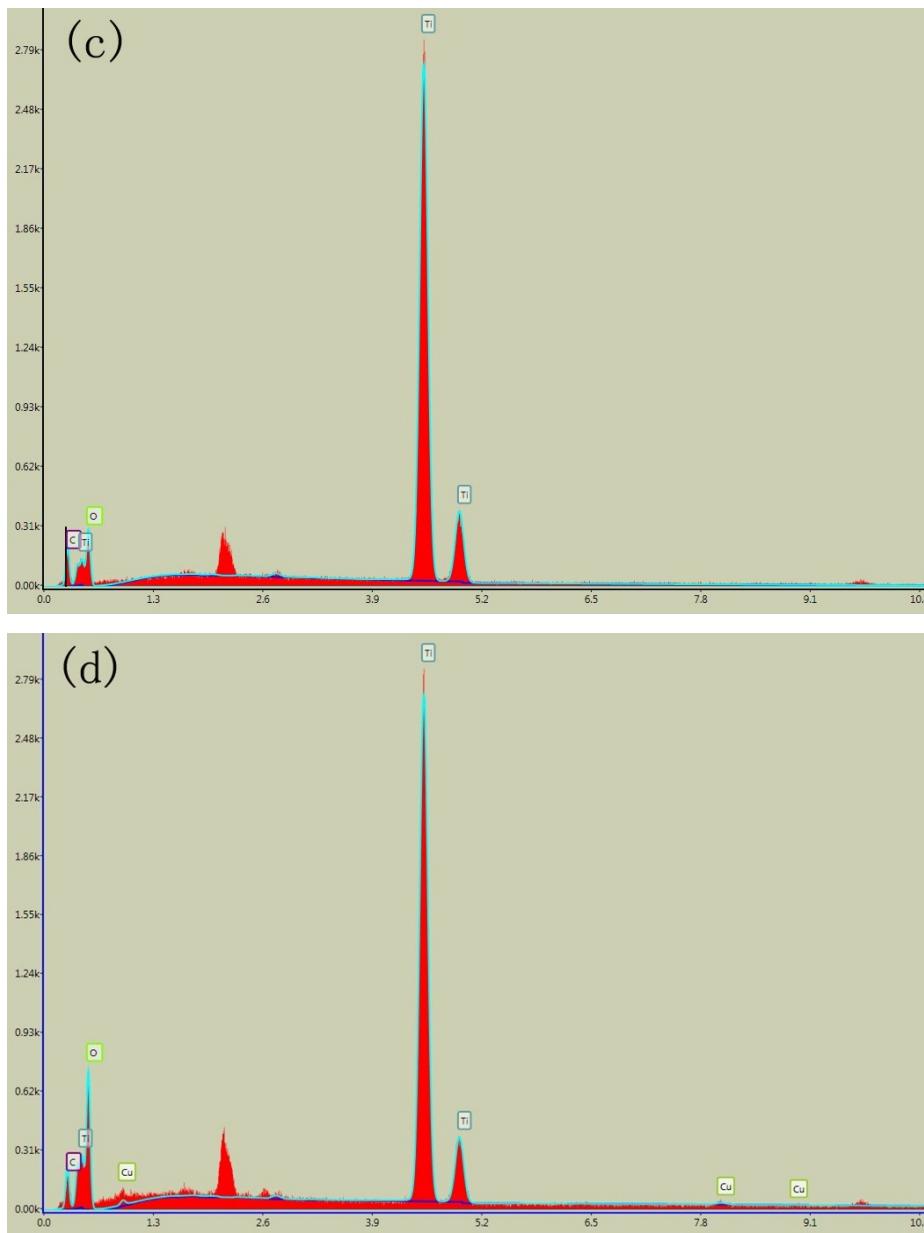


Figure S4. EDAX spectra of (a)  $\text{TiO}_2$ , (b)  $\text{TiO}_2\text{-Cu}$ , (c)  $\text{TiO}_2\text{/C}$  and (d)  $\text{TiO}_2\text{-Cu/C}$  samples.

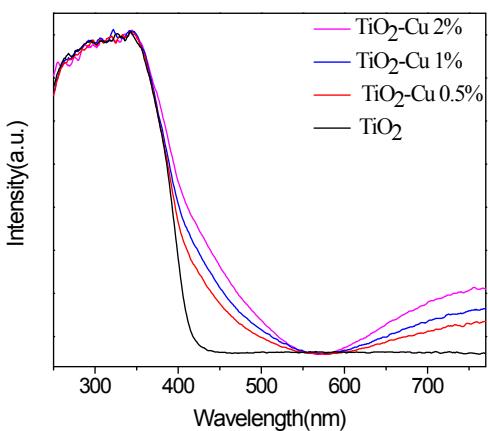


Figure S5. Diffuse reflectance UV-Vis spectra of pure  $\text{TiO}_2$  and  $\text{TiO}_2\text{-Cu x\%}$  samples.

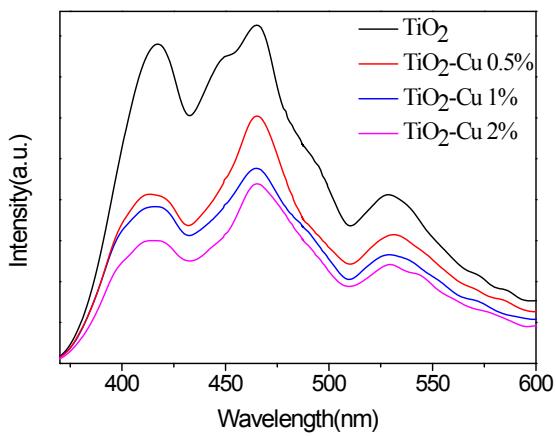


Figure S6. Photoluminescence spectra of pure  $\text{TiO}_2$  and  $\text{TiO}_2\text{-Cu}$  x% samples.

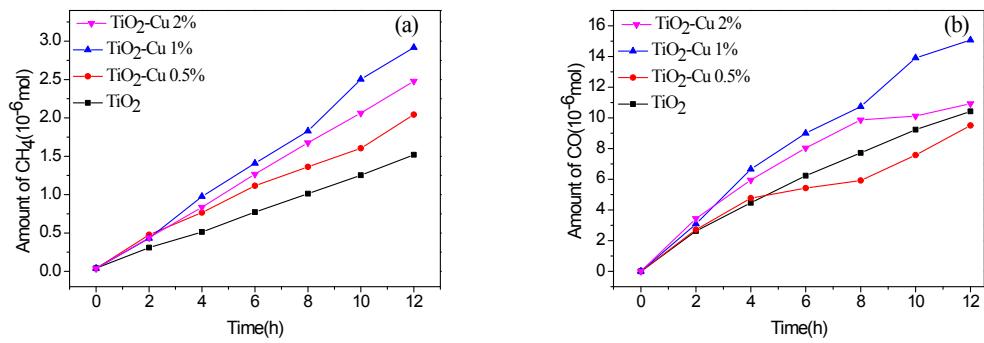
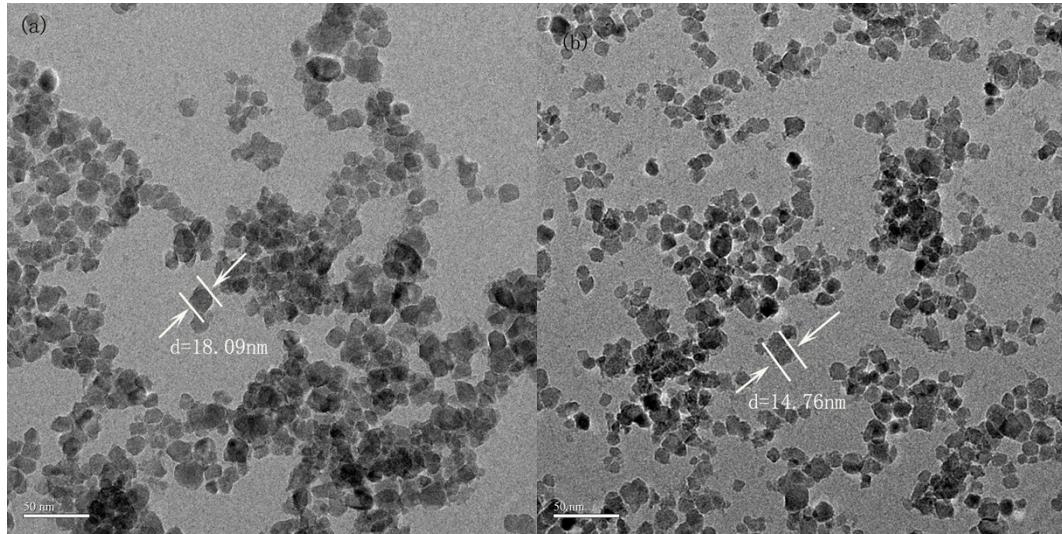


Figure S7. Photocatalytic activity for reduction of  $\text{CO}_2$  into  $\text{CH}_4$  (a) and  $\text{CO}$  (b) of pure  $\text{TiO}_2$  and  $\text{TiO}_2\text{-Cu}$  x% samples.



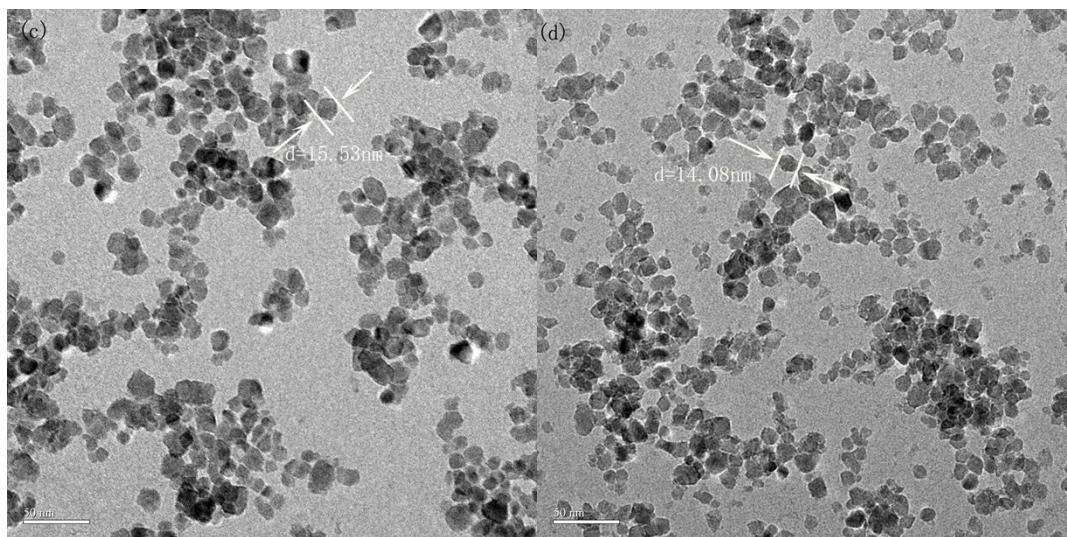


Figure S8. TEM images of pure TiO<sub>2</sub> (a), TiO<sub>2</sub>-Cu (b), TiO<sub>2</sub>/C (c) and TiO<sub>2</sub>-Cu/C (d) samples.