Supporting Information for

Self-doping for visible light photocatalytic purposes: construction of $SiO_2/SnO_2/SnO_2:Sn^{2+}$ nanostructures with tunable optical and photocatalytic performance

Menglin Sun, Yiguo Su, Chunfang Du*, Qihang Zhao, Zhiliang Liu*

College of Chemistry and Chemical Engineering, Inner Mongolia University, Hohhot, Inner Mongolia 010021, P. R. China

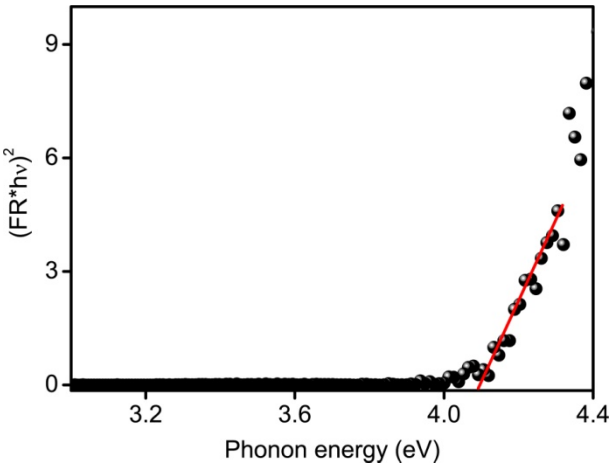

Figure S1 Relationships between $(\alpha h\nu)^2$ and photon energy of SiO_2/SnO_2.

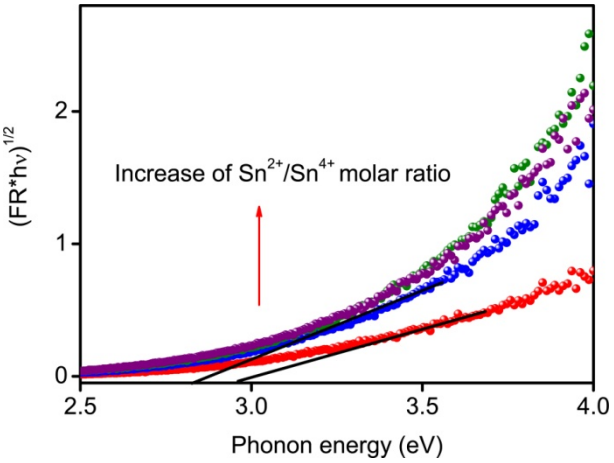

Figure S2 Relationships between $(\alpha h\nu)^{1/2}$ and photon energy of $SiO_2/SnO_2/SnO_2:Sn^{2+}$ nanostructures with different Sn^{2+}/Sn^{4+} molar ratio.

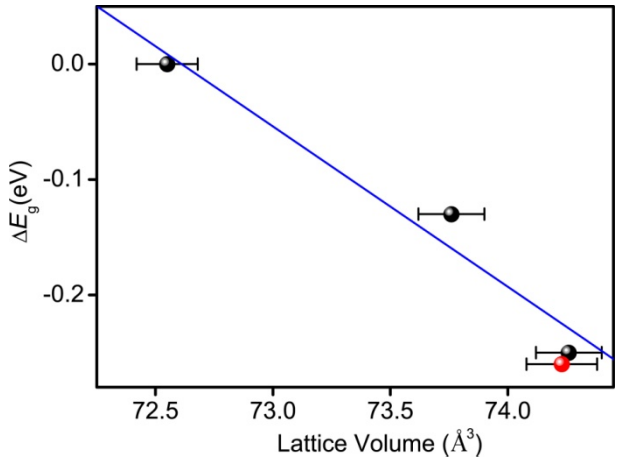

Figure S3 Correlation between the band gap energies and the lattice volume of $SiO_2/SnO_2/SnO_2:Sn^{2+}$ nanostructures.

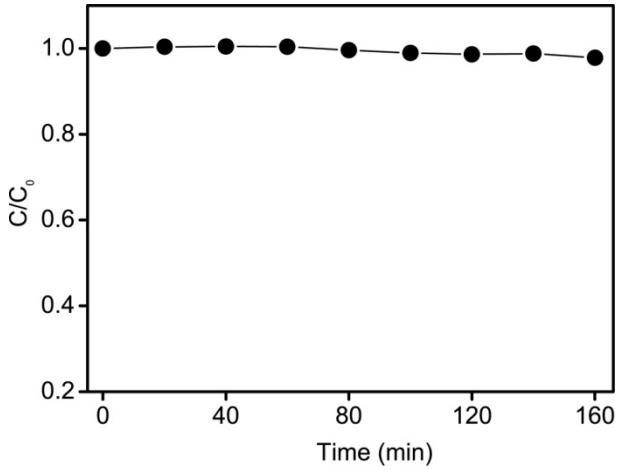

Figure S4 Normalized concentration of methyl orange versus visible light irradiation time in the absence of $SiO_2/SnO_2/SnO_2:Sn^{2+}$.

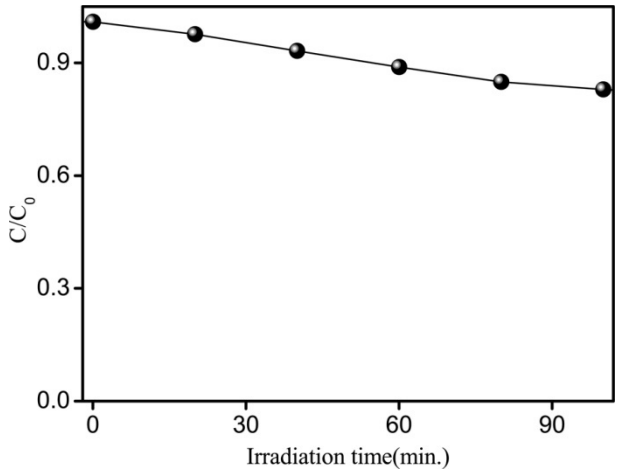

Figure S5 Normalized concentration of methyl orange versus visible light irradiation

time in the absence of SiO_2.

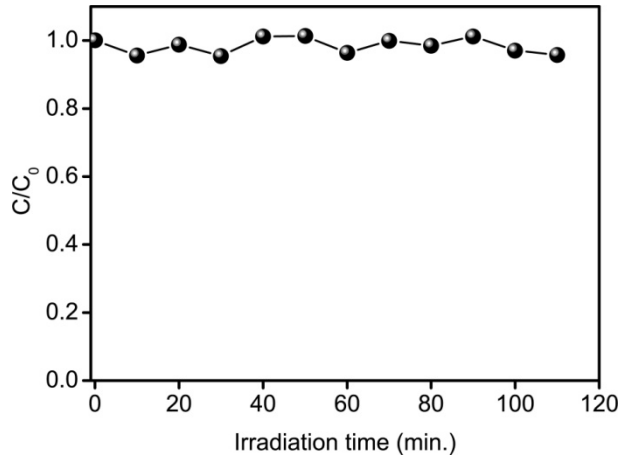

Figure S6 Normalized concentration of methyl orange versus visible light irradiation time in the absence of SnO_2:Sn^{2+} nanocrystals.

SnO_2:Sn^{2+} nanocrystals were prepared via a facile hydrothermal method. Briefly, 0.228 g $SnCl_2$ was dissolved in 20 mL ethanol with vigorous stirring to form a suspension. This suspension was sealed in 100 mL Teflon-lined stainless steel auto claves and reacted at 180 ^oC for 18 hours. The final product was washed with distilled water several times and dried at 60 ^oC for 3 hours.