

## Supporting Information

### **Preparation of ZnO quantum dots@SiO<sub>2</sub>/PVA for multifunctional coating on PET**

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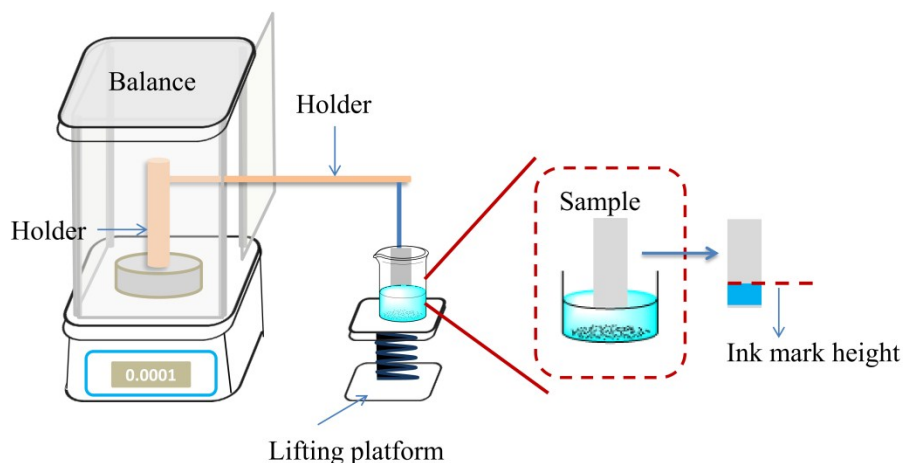


Fig. S1 Schematic diagram of ink absorption measurement.

The ink absorption rate and ink capacity of coatings were performed via electronic balance. Briefly, hang the sample (cut into a shape of 1 cm x 5 cm) above the ink as shown in Fig. S1. Adjust the height of ink until to be contacted with sample. Reset the balance reading to zero and start to record the change of display. The ink mark height is also recorded. Capacity is represented by the amount of ink per unit length, for the coating thickness is the same. The obtained capacity—time curve is used to describe the ink absorption rate of the coatings.

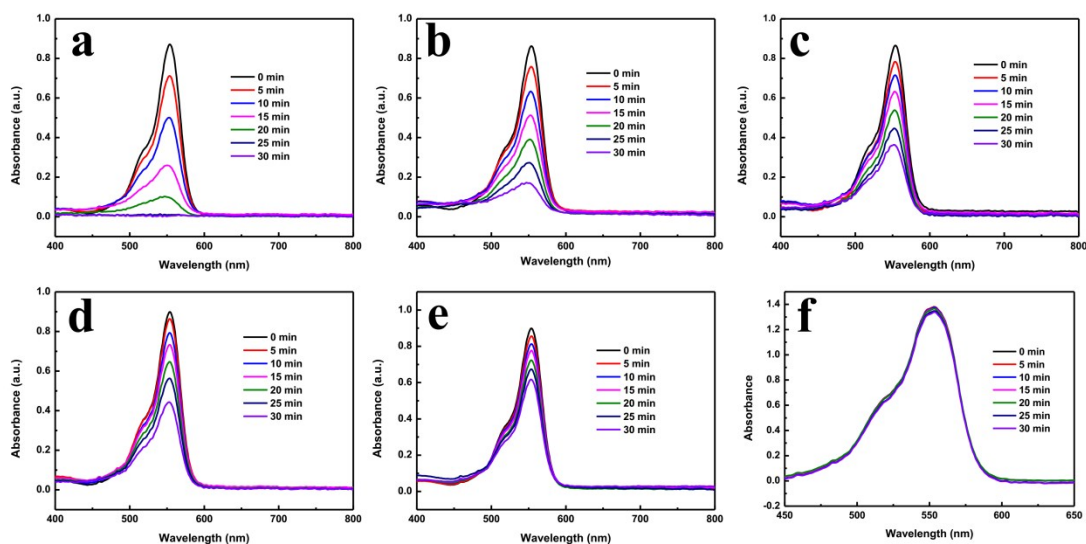


Fig. S2 Ultraviolet-visible absorption spectra recorded at an interval of 5 min up to 30 min during the photocatalytic degradation a) with ZnO QDs, b) with ZnO QDs@SiO<sub>2</sub>-0.5 TEOS, c) with ZnO QDs@SiO<sub>2</sub>-1 TEOS, d) with ZnO QDs@SiO<sub>2</sub>-1.5 TEOS, e) with ZnO QDs@SiO<sub>2</sub>-2 TEOS, and f) without any nanoparticles. (For example, ZnO QDs@SiO<sub>2</sub>-0.5 TEOS represents the ZnO QDs@SiO<sub>2</sub> nanoparticles were prepared under the TEOS-to-Zn(Ac)<sub>2</sub> molar ratio of 0.5:1.).

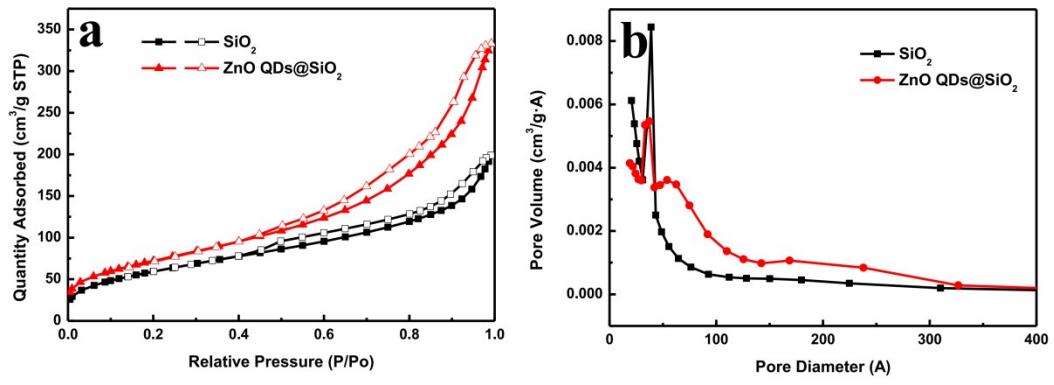


Fig. S3 a) Nitrogen adsorption/desorption isotherms of SiO<sub>2</sub> and ZnO QDs@SiO<sub>2</sub>, b) pore-size distribution of SiO<sub>2</sub> and ZnO QDs@SiO<sub>2</sub>.

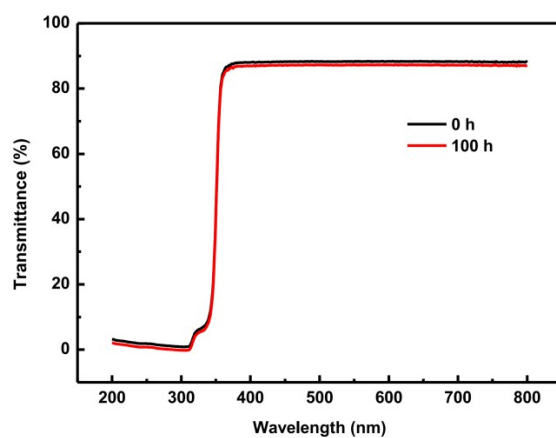


Fig. S4 UV-vis transmittance spectra of ZnO QDs@SiO<sub>2</sub>/PVA coatings (~30 μm) before and after 100 h ultraviolet aging.