Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A

Supporting information

Facile synthesis of sheet-like ZnO assembly composed of small ZnO particles for highly efficient photocatalysis

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1. SEM and TEM test of precursor

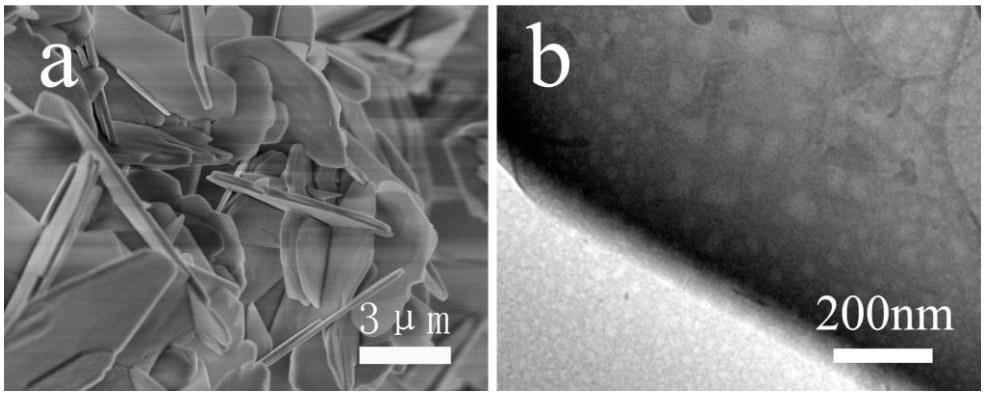

Fig.S1 SEM and TEM images of glycerol zinc precursor.

2. XRD test of precursor

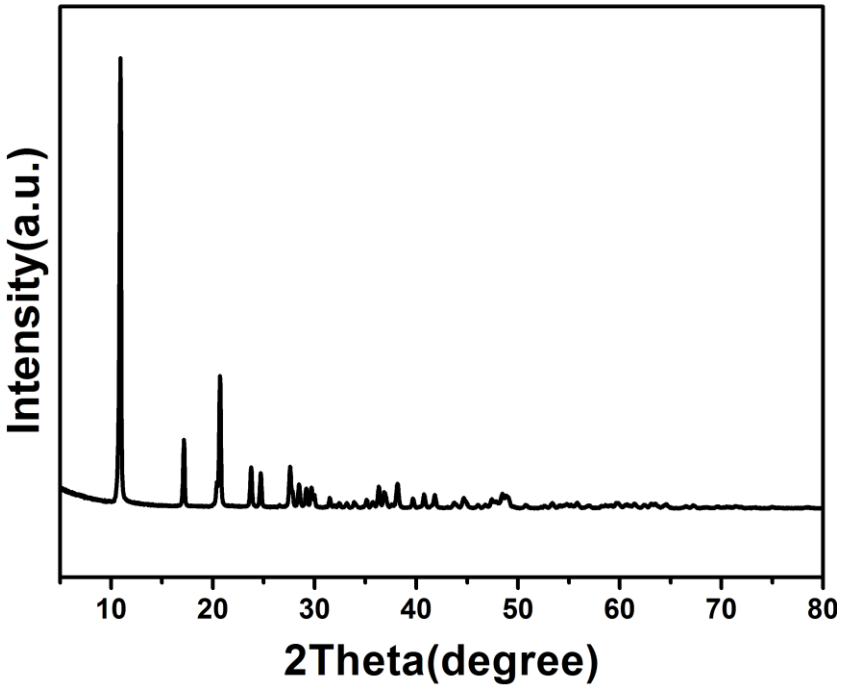

Fig.S2 XRD pattern of glycerol zinc precursor.

3. IR test of precursor

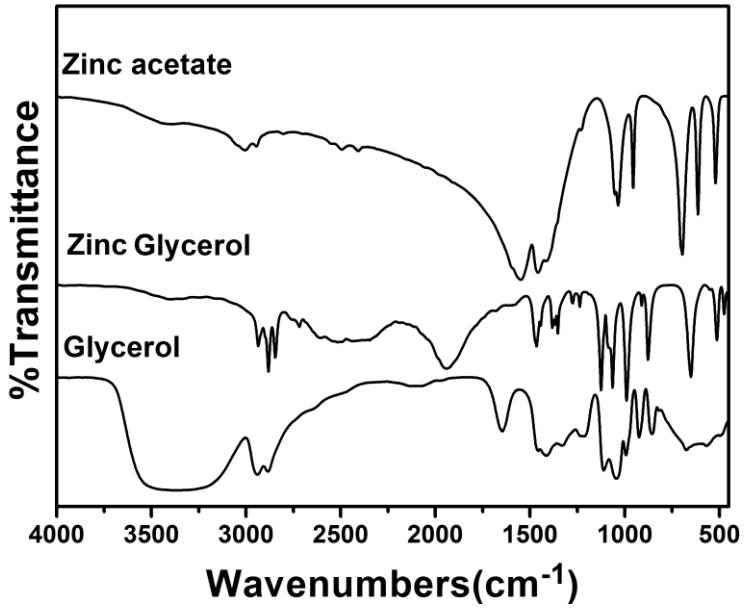

Fig.S3 IR spectra of Glycerol and glycerol zinc precursor

4. TG analysis of precursor

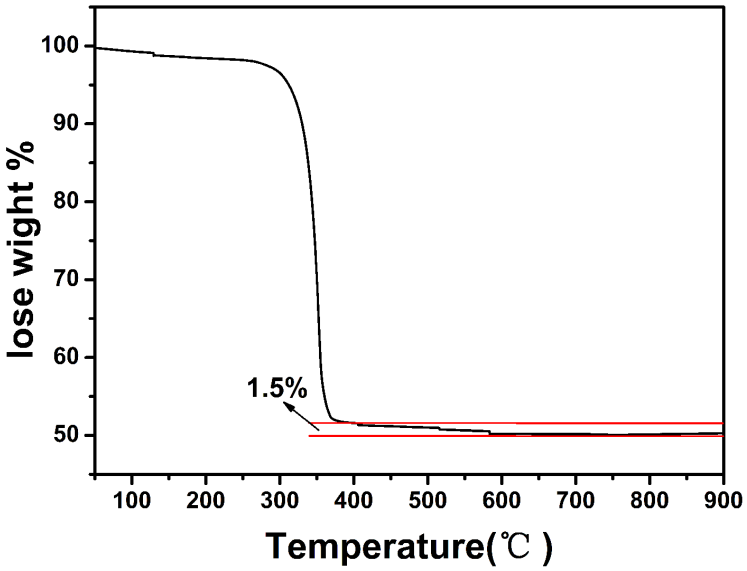

Fig.S4 TG analysis of glycerol zinc precursor.

5. XRD patterns of ZnO sheets in narrow range

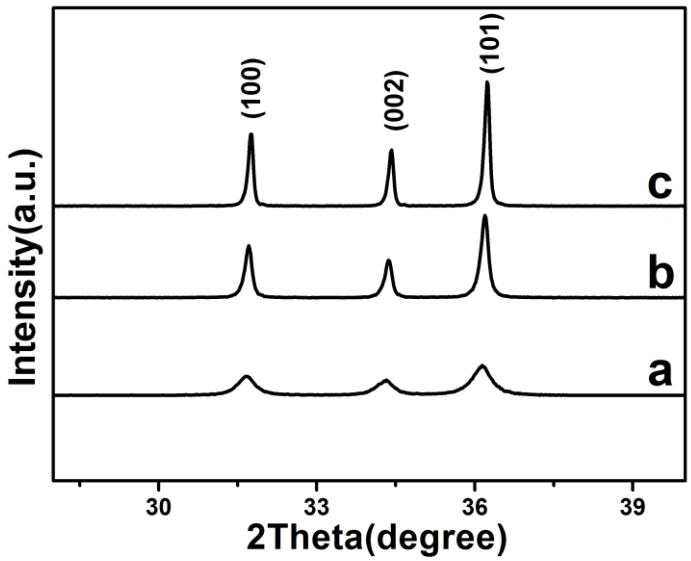

Fig. S5 XRD patterns of ZnO-400, ZnO-600 and ZnO-800 in narrow range of 24 to 42 degree.

6. IR test of ZnO sheets

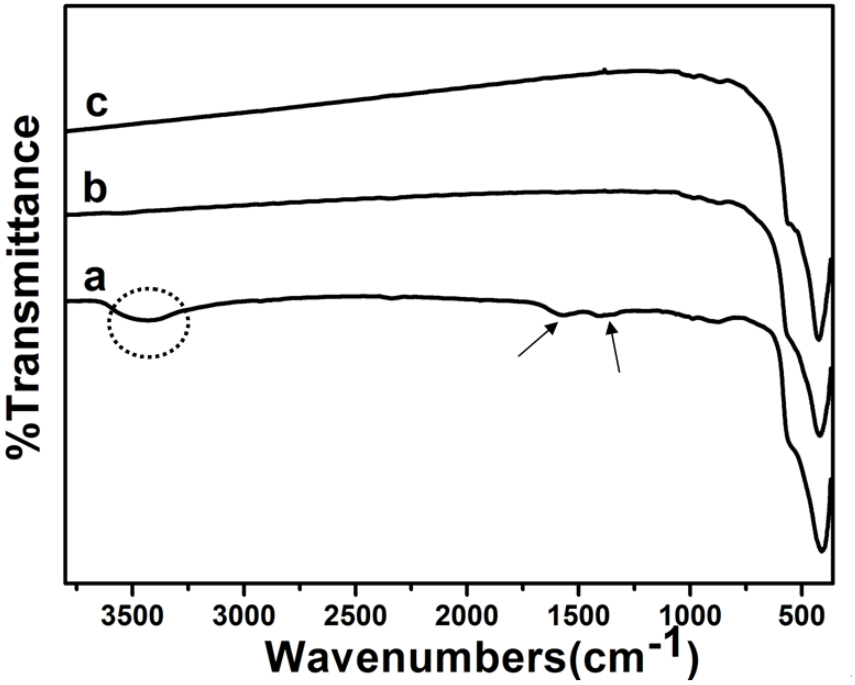

Fig. S6 IR spectra of ZnO-400, b) ZnO-600 and c) ZnO-800.

7. The photodegradation curve of MO under UV-light irradiation in the absence of catalysts

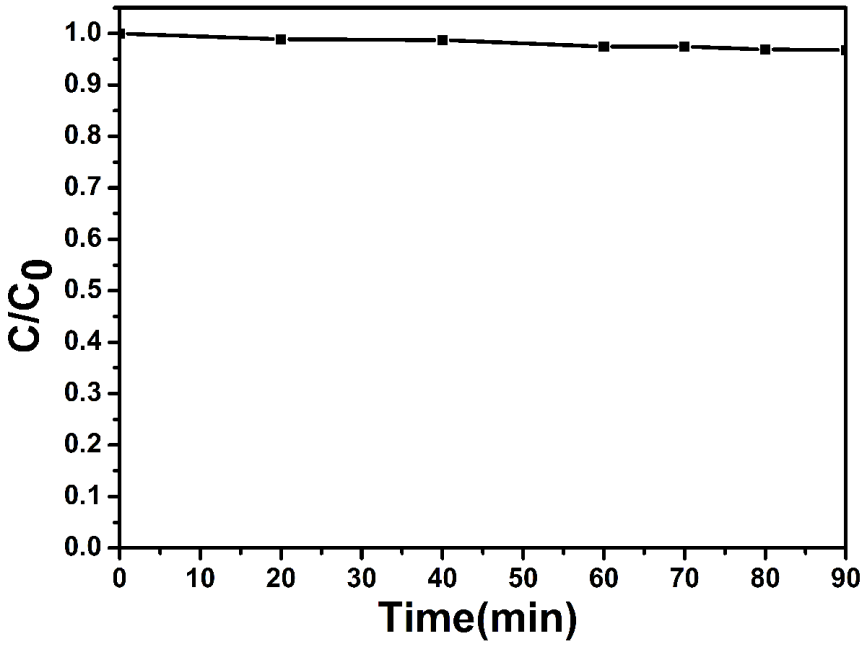

Fig. S7 The photodegradation curve of MO under UV-light irradiation with no use of catalyst.

8. The photocatalytic activity of ZnO-400, ZnO-600, ZnO-800 and P25 TiO_2 for photodegradation of 2-chlorophenol

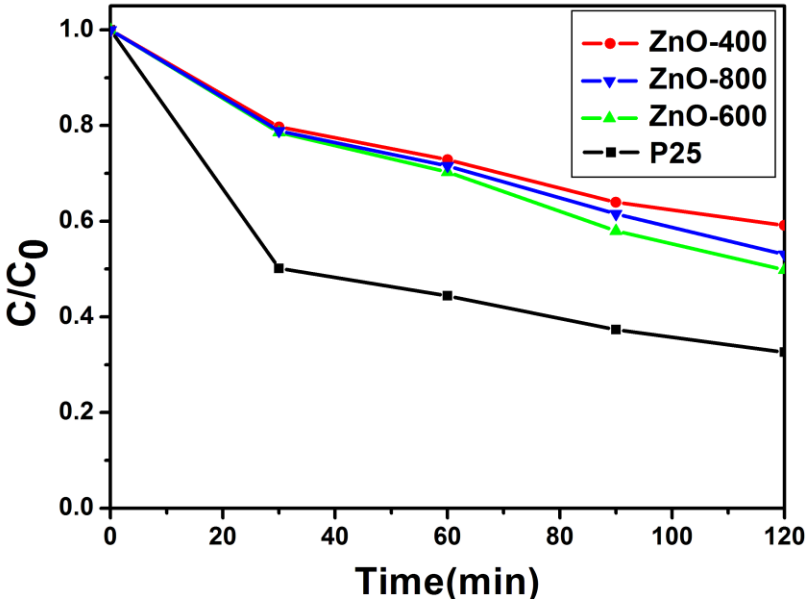

Fig. S8 The photodegradation curve of 2-chloro phenol under UV-light irradiation over ZnO-400, ZnO-600, ZnO-800 and P25 TiO_2.

9. The synthesis and characterization of Ag/ZnO-600 sheets

The Ag midified ZnO-600 (Ag/ZnO-600) was prepared through two-step assembled method. First, the Ag particles were obtained by a $NaBH_4$ reduction method as follows. A 20 mL solution with a final concentration of 0.25 mM $AgNO_3$ and 0.25 mM trisodium citrate in water was prepared. While stirring vigorously, 0.6 mL of 50 mM $NaBH_4$ was added all at once. Stirring was stopped after 30 s.

Synthesis of silver-modified ZnO sheets: ZnO sheets (0.2 g) were dispersed in 10 mL solution which contained 5mL ethanol and 5 mL coupling agent agents KH550. After stirring at the room temperature for 24h, the KH550 decorated ZnO sheets were got. The product was washed by ethanol and water in order. After that, Ag NPs sol (60 mL) was added, and stirred for 2 h. After washing with water for several times, the silver modified ZnO sheets were finally obtained.

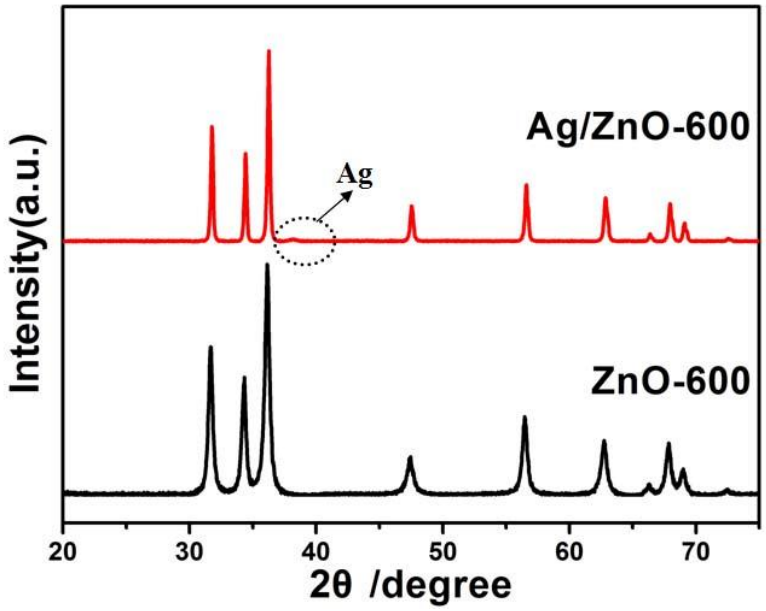

Fig. S9 XRD pattern of Ag/ZnO-600. For comparison, the XRD pattern of original ZnO-600 is also given.

From the patterns, we can see that the peaks belonging to Silver are very weak, indicating the low content of Ag in Ag/ZnO-600 samples. The calculated value of Ag in ZnO is about 0.8% on the basic of experimental parameters.