Electronic Supplementary Material (ESI) for RSC Advances.

Supporting information

Fabrication and characterization of Ag_2CO_3/SnS_2 composites with enhanced visible-light photocatalytic activity for the degradation of organic pollutants

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Synthesis of mechanically mixed Ag_2CO_3(2.0wt%)/SnS_2 sample:

Mechanically mixed Ag_2CO_3(2.0wt%)/SnS_2 sample was prepared by finely grinding 0.01 g of Ag_2CO_3 with 0.49 g of SnS_2. The obtained product was denoted as mechanically mixed Ag_2CO_3(2.0wt%)/SnS_2.

Photocatalytic degradation of rodamine B (RhB):

The photocatalytic performance of the as-prepared samples was evaluated by the degradation of RhB in aqueous solution under visible light. A 500 W Xe-arc lamp equipped with a 420 nm cutoff filter was used as a visible light source. In a typical photocatalytic measurement, suspension including the photocatalyst (50 mg) and RhB solution (150 mL, 20 mg L^{-1}) was laid in a 250 mL cylindrical quartz reactor equipped with a water circulation facility. Before irradiation, the reaction suspension was ultrasonicated for 5 min and stirred in the dark for 60 min to ensure the equilibrium of adsorption and desorption. During the photocatalytic tests, 5 mL of the suspension was obtained at a given time intervals, followed by centrifugation at 10000 rpm for 10 min to remove the photocatalyst. The concentration of the remaining RhB was measured by its absorbance (*A*) at 553 nm with a Hitachi UV-3010 spectrophotometer. The degradation ratio of RhB can be calculated by $X=(A_0-A_t)/A_0\times100\%$, where A_0 and A_t are the concentration of RhB before illumination and after illumination time *t*.

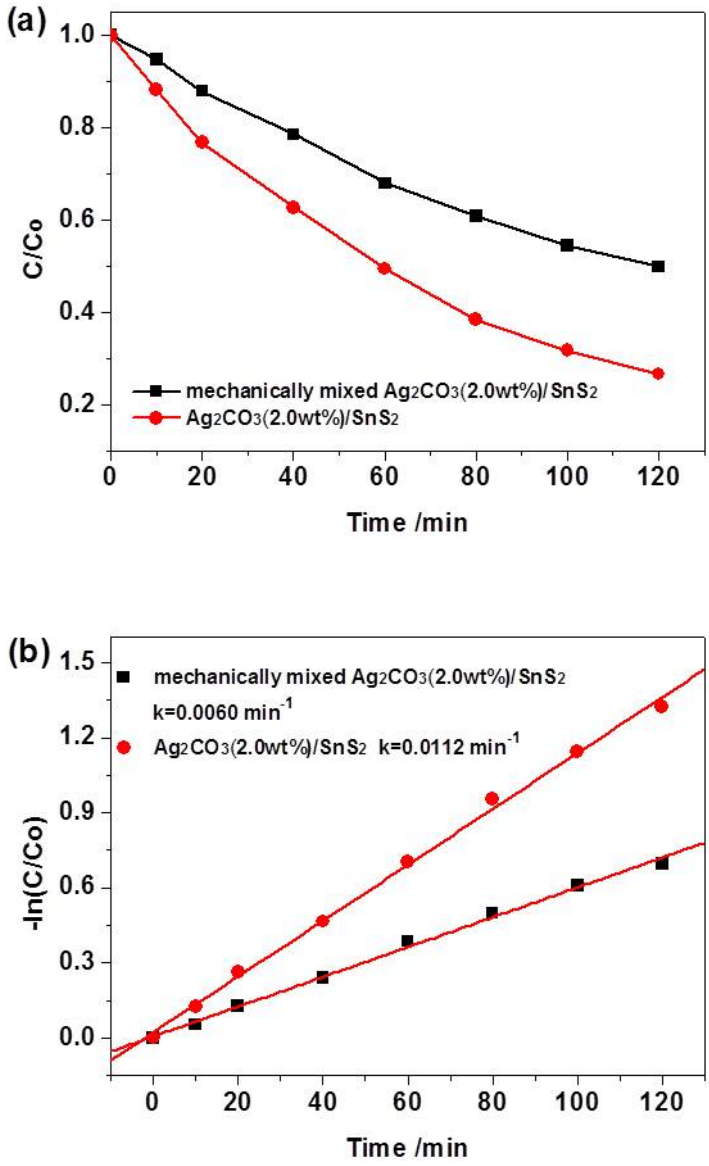

Fig. S1. Comparison of photocatalytic activities (a) and first-order kinetic plots (b) for the photodegradation of MO in aqueous solution over Ag_2CO_3(2.0wt%)/SnS_2 composite to mechanically mixed Ag_2CO_3(2.0wt%)/SnS_2.

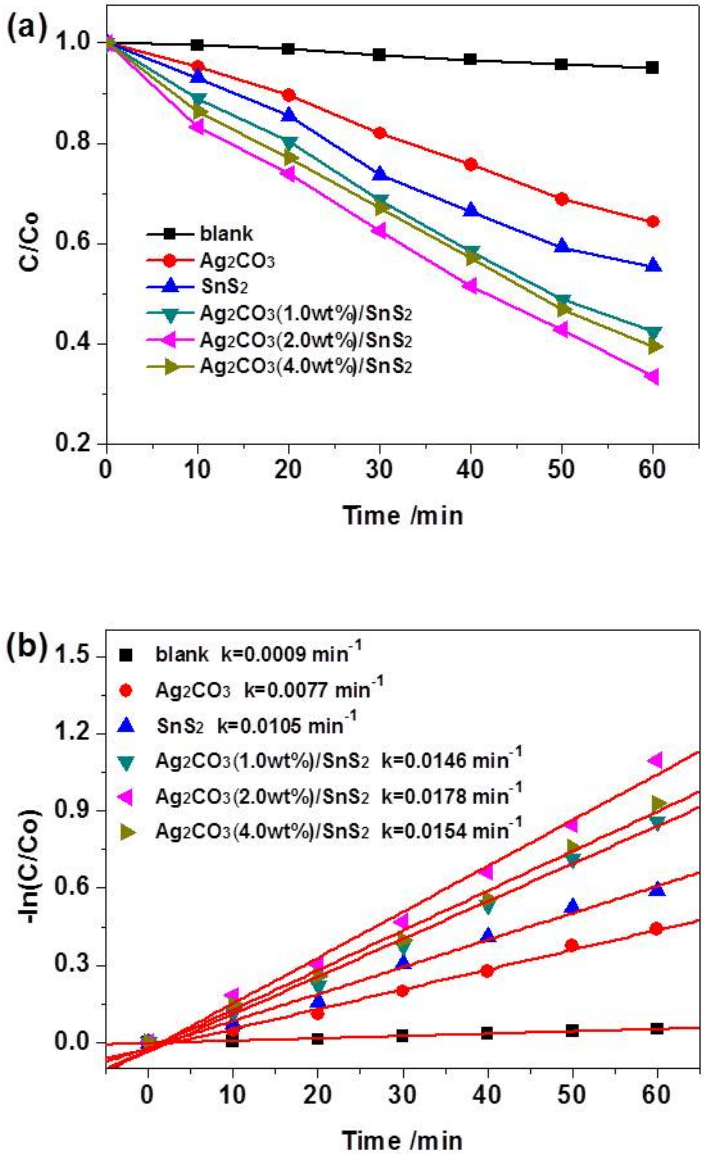

Fig. S2. Photocatalytic activities (a) and first-order kinetic plots (b) for the photodegradation of RhB in aqueous solution over the as-prepared samples under visible light irradiation.

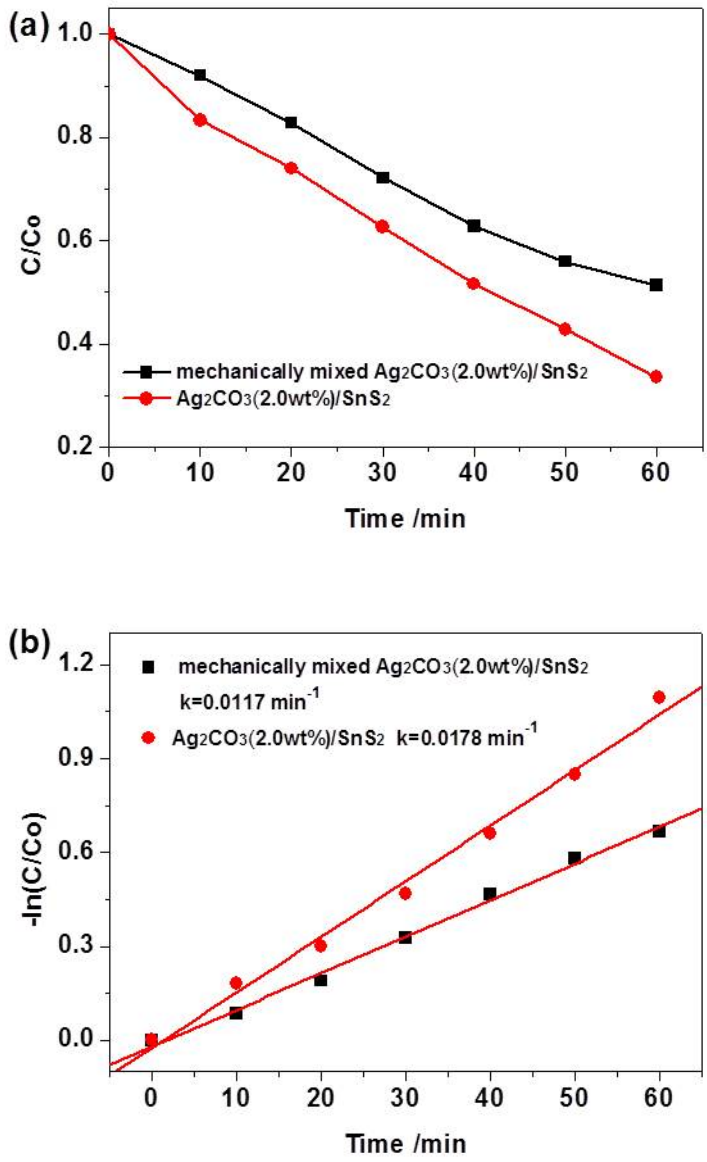

Fig. S3. Comparison of photocatalytic activities (a) and first-order kinetic plots (b) for the photodegradation of RhB in aqueous solution over Ag_2CO_3(2.0wt%)/SnS_2 composite to mechanically mixed Ag_2CO_3(2.0wt%)/SnS_2.