

Figures caption

Figure 1: Schematic diagram for preparing the SrTiO₃/rGO@Ag nanocomposites

Figure 2: (a) XRD patterns of SrTiO₃/rGO_x (x = 0, 5, 10, 15 and 20%) and SrTiO₃/rGO₂₀@Ag_x (x = 2 and 4%), normalized by the highest intensity to one. (b) The characteristic crystalline parameter (a), the average grain sizes (D), microconstraint (ξ%) for the composites SrTiO₃/rGO_x (x=0, 5, 10, 15 and 20%).

Figure 3: In top SEM images of SrTiO₃ (a and b) and SrTiO₃/rGO_x composites (c–h) with different amount of rGO. In bottom (a) the widths of SrTiO₃ nanocubes is in the range 51 nm, (b) the composition of SrTiO₃ were obtained by EDX analysis.

Figure 4: Hydrodynamic diameter of SrTiO₃ in H₂O suspension.

Figure 5: FT-IR spectra of GO, SrTiO₃/rGO_x (x = 0, 5, 10, 15 and 20%) and SrTiO₃/rGO₂₀@Ag_x (x = 1 and 2%) nanocomposites.

Figure 6: (a) Raw Raman spectra of SrTiO₃/rGO_x (x = 5, 10, 15 and 20%) nanocomposites, (b) subtract straight line Raman spectra of SrTiO₃/rGO_x (x = 20%) present D/G and 2D/G ratios.

Figure 7: the columns (a) side, (b) bottom, and (c) top views of SrTiO₃/rGO on top, and SrTiO₃/rGO@Ag in bottom. The column (d): on top the distance (Å) of C–Ti, and the bottom C–O

Figure 8: Band structure of SrTiO₃ (red), rGO (black), SrTiO₃/rGO (blue), and SrTiO₃/rGO@Ag (orange).

Figure 9: UV-Visible spectra of SrTiO₃/rGO_x (x=0, 5, 10, 15 and 20%) and SrTiO₃/rGO₂₀@Ag_x (x = 2 and 4%) nanocomposites. The insert figure: variation of the

band gap E_g according to Kubelka-Munk method and variation of Urbach energy E_U .

All spectra are normalized to one by the maximum of absorbance.

Figure 10: Adsorption kinetic curves of MB on SrTiO₃/rGO_x (x= 0, 5, 10, 15 and 20%) nanocomposites.

Figure 11: Photodegradation of MB dye by SrTiO₃/rGO_x (x= 0, 5, 10, 15 and 20%) (Left) and SrTiO₃/rGO₂₀@Ag_x (x = 1, 2, 3 and 4%) (Right) nanocomposites.

Figure 12: Recycled SrTiO₃/rGO₂₀@Ag₂ photocatalyst for four times

Figure 13: Schematic illustration of the photocatalytic mechanism of SrTiO₃/rGO@Ag nanocomposite.