Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics

Electronic Supplementary Information

Sunlight–Driven Ag/AgCl$_{1-x}$Br$_x$ Photocatalysts: Enhanced Catalytic Performances *via* a Continuous Bandgap–Tuning and Morphology Selection

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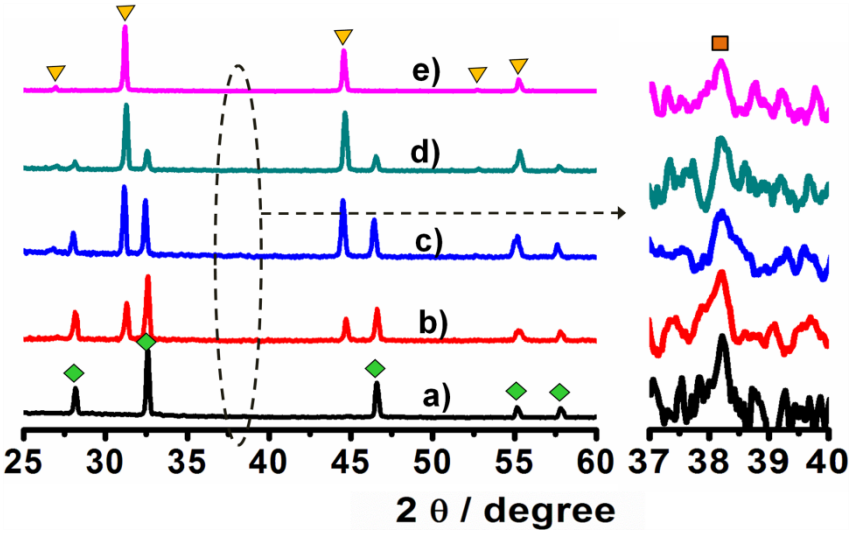

Fig. S1 XRD patterns of the mixture of the two terminal matters, Ag/AgCl and Ag/AgBr. a): Ag/AgCl:Ag/AgBr = 1:0. b): Ag/AgCl:Ag/AgBr = 0.75:0.25. c): Ag/AgCl:Ag/AgBr = 0.5:0.5. d): Ag/AgCl:Ag/AgBr = 0.25:0.75. e): Ag/AgCl:Ag/AgBr = 0:1. The diffraction peaks ascribing to AgCl and AgBr are marked with ◆ and ▼, respectively (left panel), while those to Ag are enlarged and marked with ■ (right panel).

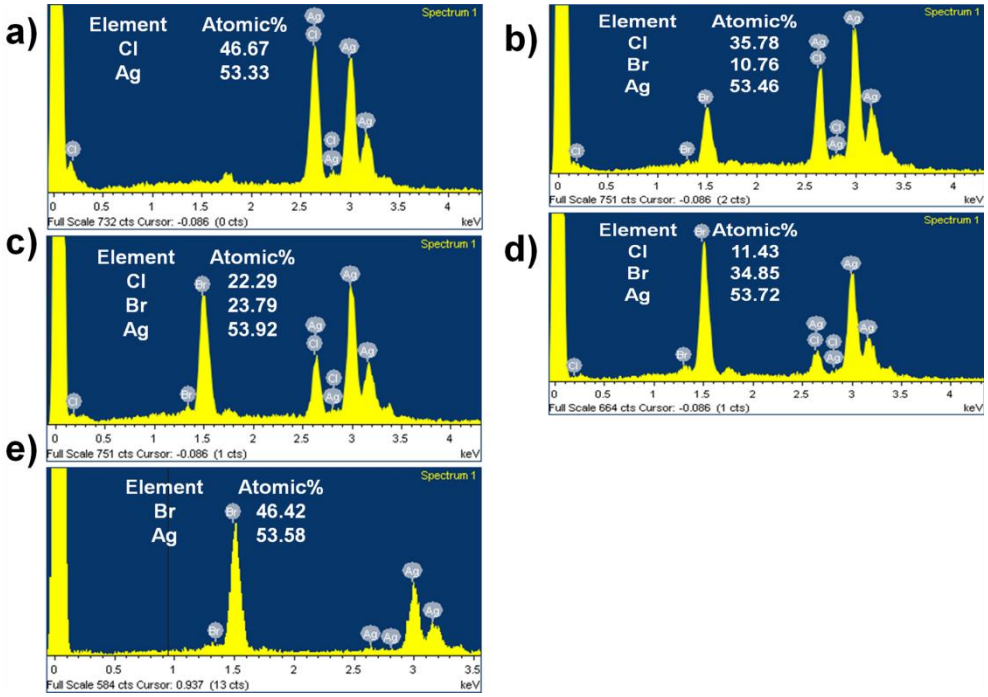

Fig. S2 EDX elemental analyses of the Ag/AgCl$_{1-x}$Br$_x$ synthesized in the cubic system. a): Ag/AgCl (S(0)). b): Ag/AgCl$_{0.75}$Br$_{0.25}$ (S(0.25)). c): Ag/AgCl$_{0.5}$Br$_{0.5}$ (S(0.5)). d): Ag/AgCl$_{0.25}$Br$_{0.75}$ (S(0.75)). e): Ag/AgBr (S(1)).

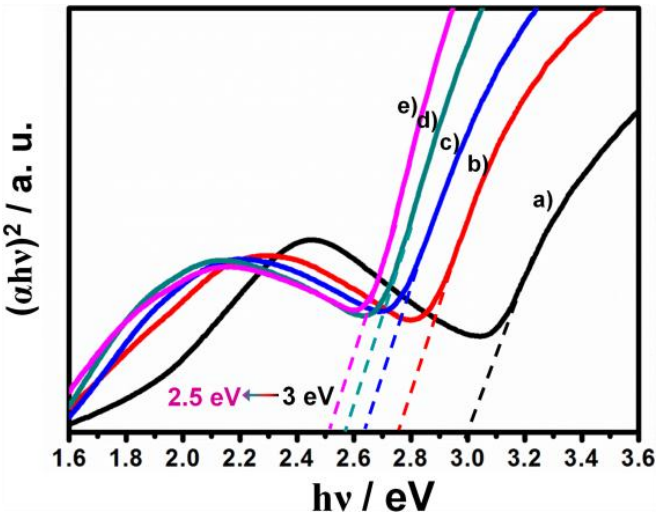

Fig. S3 Plots of $(\alpha h\nu)^2$ *vs.* photon energy for the Ag/AgCl$_{1-x}$Br$_x$ synthesized in the cubic system: Ag/AgCl (a), Ag/AgCl$_{0.75}$Br$_{0.25}$ (b), Ag/AgCl$_{0.5}$Br$_{0.5}$ (c), Ag/AgCl$_{0.25}$Br$_{0.75}$ (d), and Ag/AgBr (e).

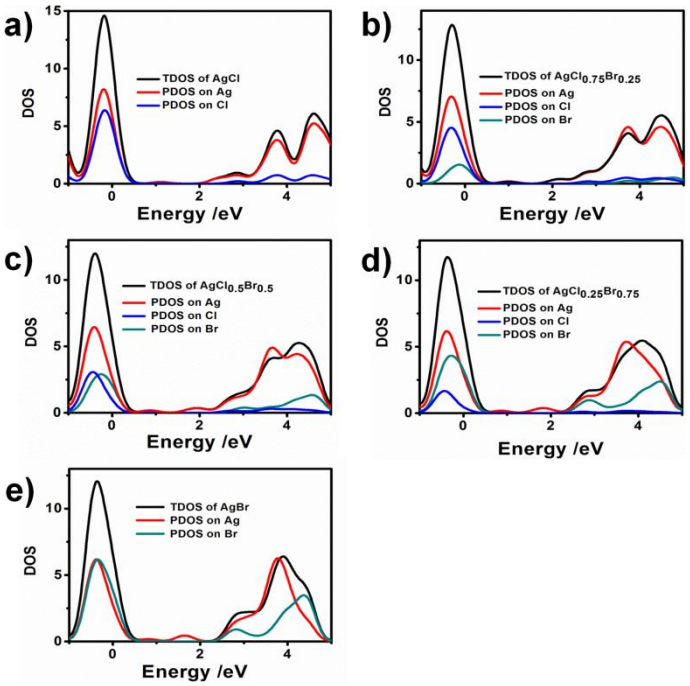

Fig. S4 Total DOS (TDOS) and projected DOS (PDOS) of $AgCl_{1-x}Br_x$. a): AgCl. b): $AgCl_{0.75}Br_{0.25}$. c): $AgCl_{0.5}Br_{0.5}$. d): $AgCl_{0.25}Br_{0.75}$. e): AgBr.

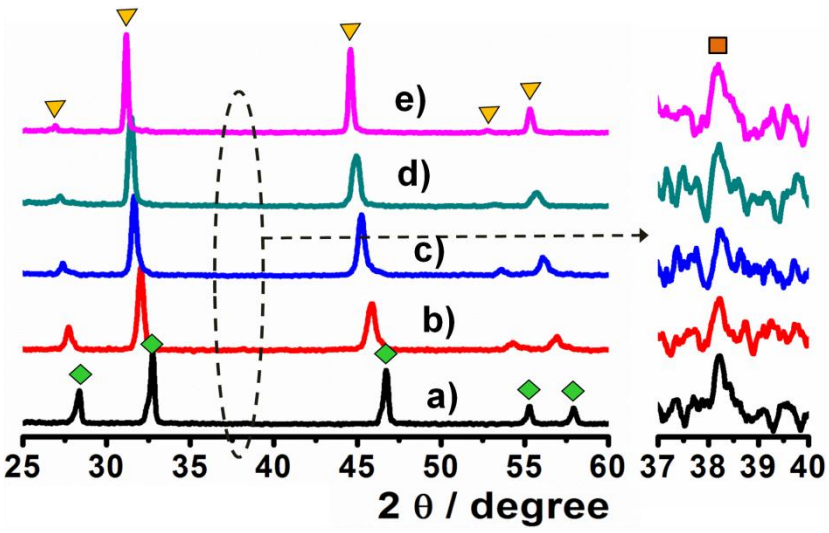

Fig. S5 XRD patterns of the $Ag/AgCl_{1-x}Br_x$ formulated in the spherical system. a): Ag/AgCl. b): $Ag/AgCl_{0.75}Br_{0.25}$ c): $Ag/AgCl_{0.5}Br_{0.5}$ d): $Ag/AgCl_{0.25}Br_{0.75}$ e): Ag/AgBr. The diffraction peaks ascribing to AgCl and AgBr are marked with ◆ and ▼, respectively (left), while those to Ag are enlarged and marked with ■ (right).

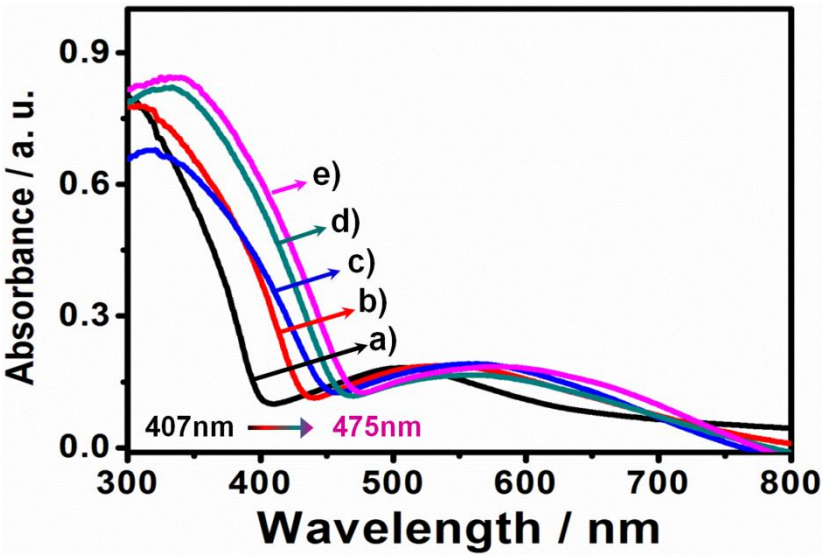

Fig. S6 UV-visible diffuse reflectance spectra of the Ag/$AgCl_{1-x}Br_x$ nanospecies synthesized in the spherical system: Ag/AgCl (a), Ag/$AgCl_{0.75}Br_{0.25}$ (b), Ag/$AgCl_{0.5}Br_{0.5}$ (c), Ag/$AgCl_{0.25}Br_{0.75}$ (d), and Ag/AgBr (e).

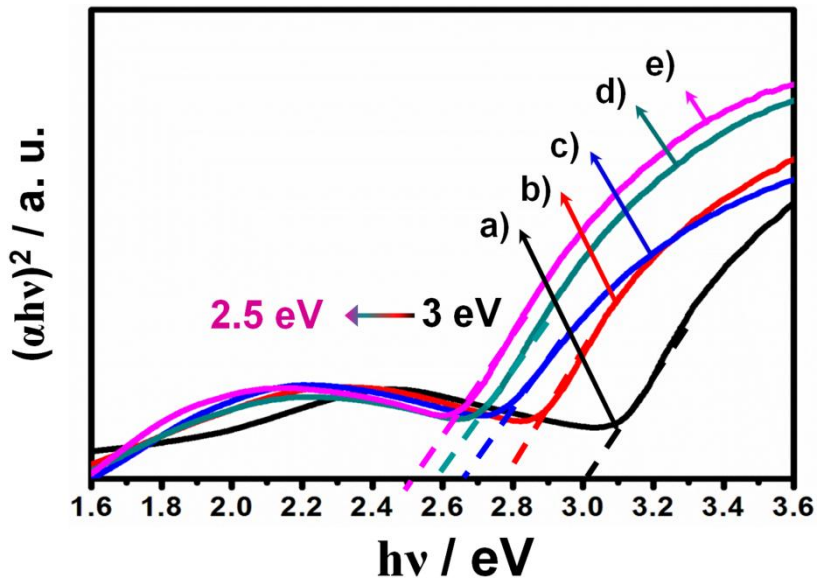

Fig. S7 Plot of $(\alpha h\nu)^2$ *vs.* photon energy for the Ag/$AgCl_{1-x}Br_x$ nanospecies synthesized in the spherical system: Ag/AgCl (a), Ag/$AgCl_{0.75}Br_{0.25}$ (b), Ag/$AgCl_{0.5}Br_{0.5}$ (c), Ag/$AgCl_{0.25}Br_{0.75}$ (d), and Ag/AgBr (e).

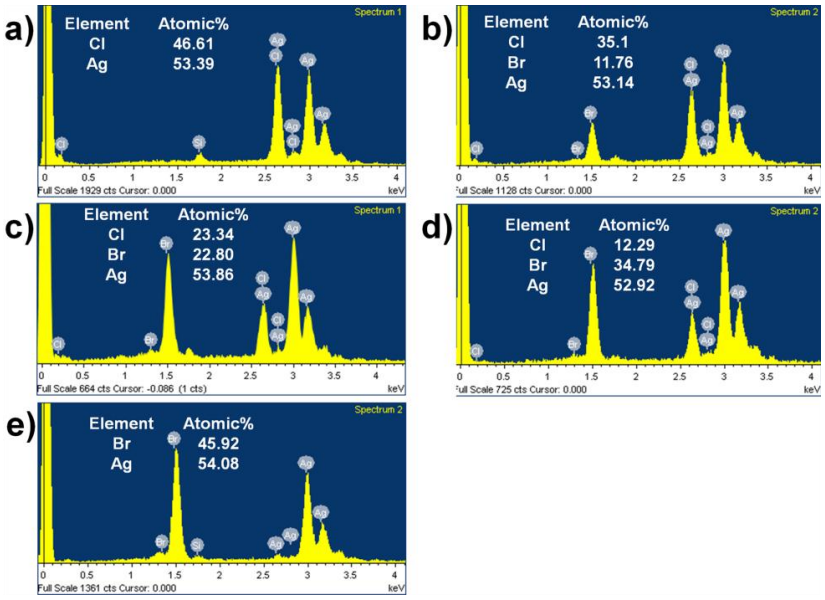

Fig. S8 EDX elemental analyses of the Ag/$AgCl_{1-x}Br_x$ nanospecies synthesized in the spherical system: Ag/AgCl (a), Ag/$AgCl_{0.75}Br_{0.25}$ (b), Ag/$AgCl_{0.5}Br_{0.5}$ (c), Ag/$AgCl_{0.25}Br_{0.75}$ (d), and Ag/AgBr (e).