## Supplementary Information

## Water-Driven Boost of the Visible Light Photocatalytic Performance of

## $\mathrm{Cs}_{2} \mathrm{AgBiBr}_{6}$ Double Perovskite Nanocrystals

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Figure S1. SAED pattern of water soaked $\mathrm{Cs}_{2} \mathrm{AgBiBr}_{6} \mathrm{NCs}$.

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Figure S 2 . XRD patterns of $\mathrm{Cs}_{2} \mathrm{AgBiBr}_{6} \mathrm{NCs}$ soaked in water for 30 min and 80 min when the volume ratio of anhydrous ethanol to water was 10:0.


Figure S3. XRD patterns of $\mathrm{Cs}_{2} \mathrm{AgBiBr}_{6} \mathrm{NCs}$ soaked in water for 30 min and 80 min when the volume ratio of anhydrous ethanol to water was 8:2.


Figure S4. XRD patterns of $\mathrm{Cs}_{2} \mathrm{AgBiBr}_{6} \mathrm{NCs}$ soaked in water for 30 min and 80 min when the
volume ratio of anhydrous ethanol to water was 1:1.


Figure S5. XRD patterns of $\mathrm{Cs}_{2} \mathrm{AgBiBr}_{6} \mathrm{NCs}$ soaked in water for 30 min and 80 min when the volume ratio of anhydrous ethanol to water was $2: 8$.


Figure S6. XRD patterns of $\mathrm{Cs}_{2} \mathrm{AgBiBr}_{6} \mathrm{NCs}$ soaked in water for 30 min and 80 min when the volume ratio of anhydrous ethanol to water was $0: 10$.


Figure S 7 . Plots of $\mathrm{C}_{\mathrm{t}} / \mathrm{C}_{0}$ versus the irradiation time for photocatalytic degradation of RhB by BiOBr .


Figure S8. Stability tests of the $\mathrm{Cs}_{2} \mathrm{AgBiBr}_{6} \mathrm{NCs}$ in multiple photocatalytic degradation cycles.


Figure S 9 . The XRD patterns of $\mathrm{Cs}_{2} \mathrm{AgBiBr}_{6} \mathrm{NCs}$ before and after the stability tests.


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