Supporting Information For:

**AgInₙGa₁₋ₙS₂ solid solution nanocrystals: synthesis, band gap tuning and photocatalytic activity**

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**Fig. S1** XRD patterns of orthorhombic AgInS₂, tetragonal AgInS₂ and AgGaS₂.
**Fig. S2** EDX spectra and elemental distribution maps for Ag, In, Ga and S of the as-prepared AgIn$_{0.5}$Ga$_{0.5}$S$_2$ solid solutions.

**Fig. S3** EDX spectra and elemental distribution maps for Ag, In, Ga and S of the as-prepared AgIn$_{0.3}$Ga$_{0.7}$S$_2$ solid solution.
**Fig. S4** EDX spectra and elemental distribution maps for Ag, In, Ga and S of the as-prepared AgIn$_{0.7}$Ga$_{0.3}$S$_2$ solid solution.

**Fig. S5** Photocatalytic degradation of phenol aqueous solution (0.2 mmol L$^{-1}$) with AgIn$_{0.7}$Ga$_{0.3}$S$_2$ as photocatalyst under visible light irradiation ($\lambda>$400 nm).