Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.


# Electronic Supplementary Information

## Seeded-mediated growth of ternary Ag-In-S and quaternary Ag-In-Zn-S nanocrystals from binary $Ag_2S$ seeds and the composition-tunable optical properties

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## Figure S1

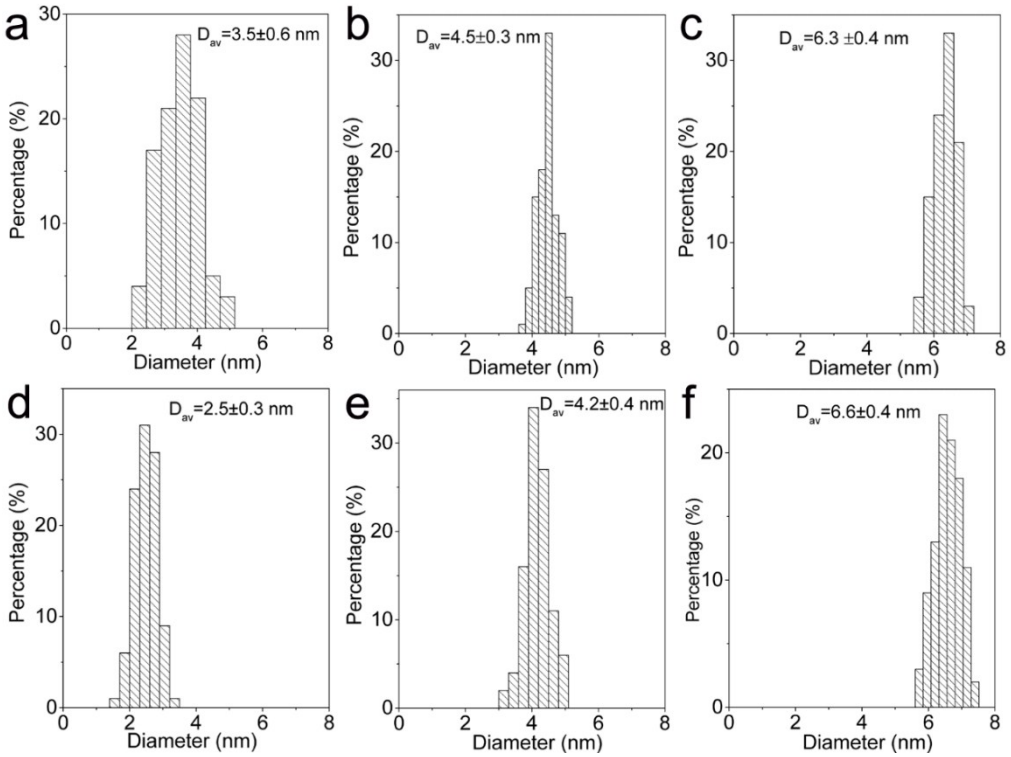


**Figure S1**. Size distribution histograms of parent $Ag_2S$ NCs synthesized at (a)130°C, (b)180°C, (c) 230°C and (d-f) corresponding AIS NCs synthesized from different-sized $Ag_2S$ NC seeds.

## Figure S2

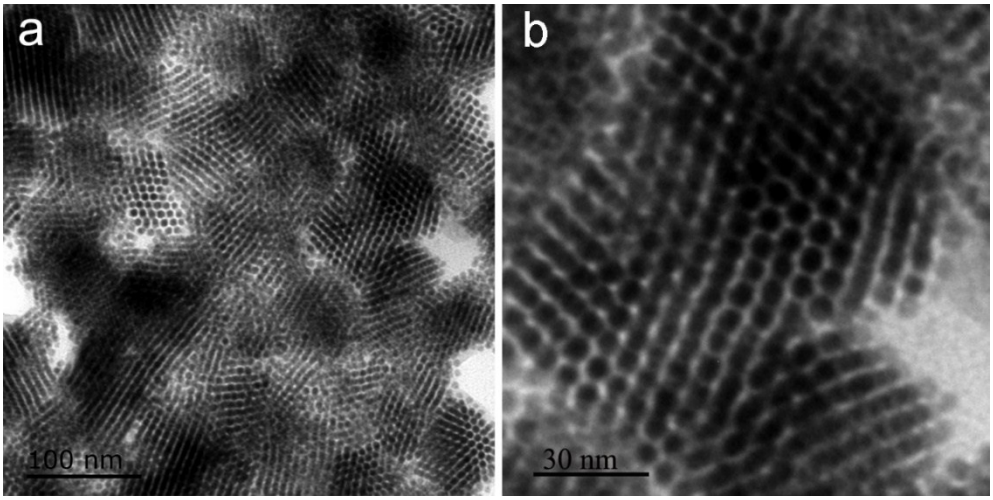


**Figure S2.** TEM images of self-assembled $Ag_2S$ NCs.

**Figure S3**

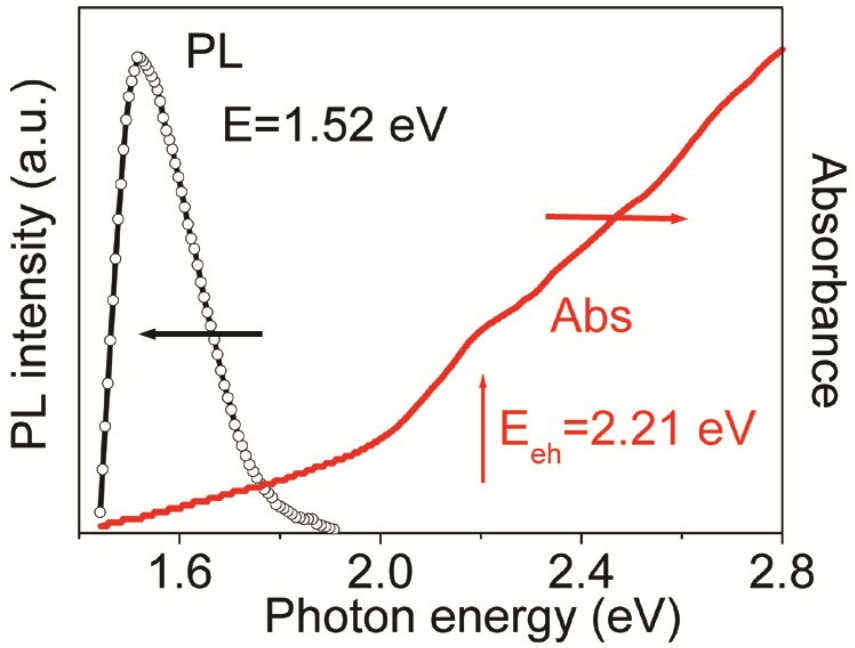


**Figure S3**. PL and absorption spectra of AIS NCs synthesized from 6.3 nm-sized $Ag_2S$ NC seeds.

**Figure S4**

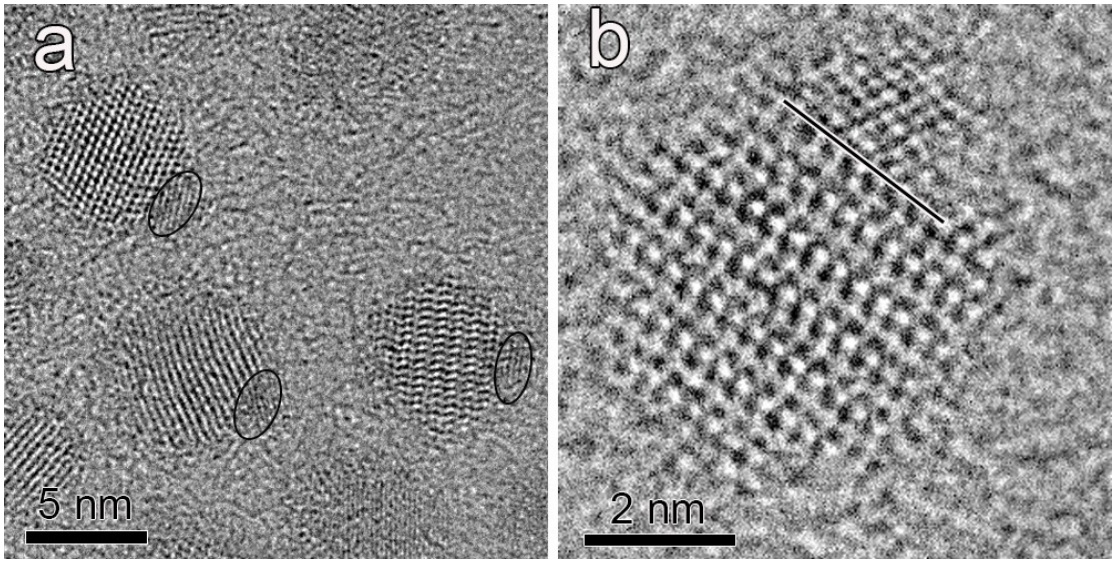


**Figure S4.** Typical HRTEM images of the intermediate NCs obtained at 10 min during the synthesis of AIS NCs from 6.3 nm-sized $Ag_2S$ seeds.

**Figure S5**

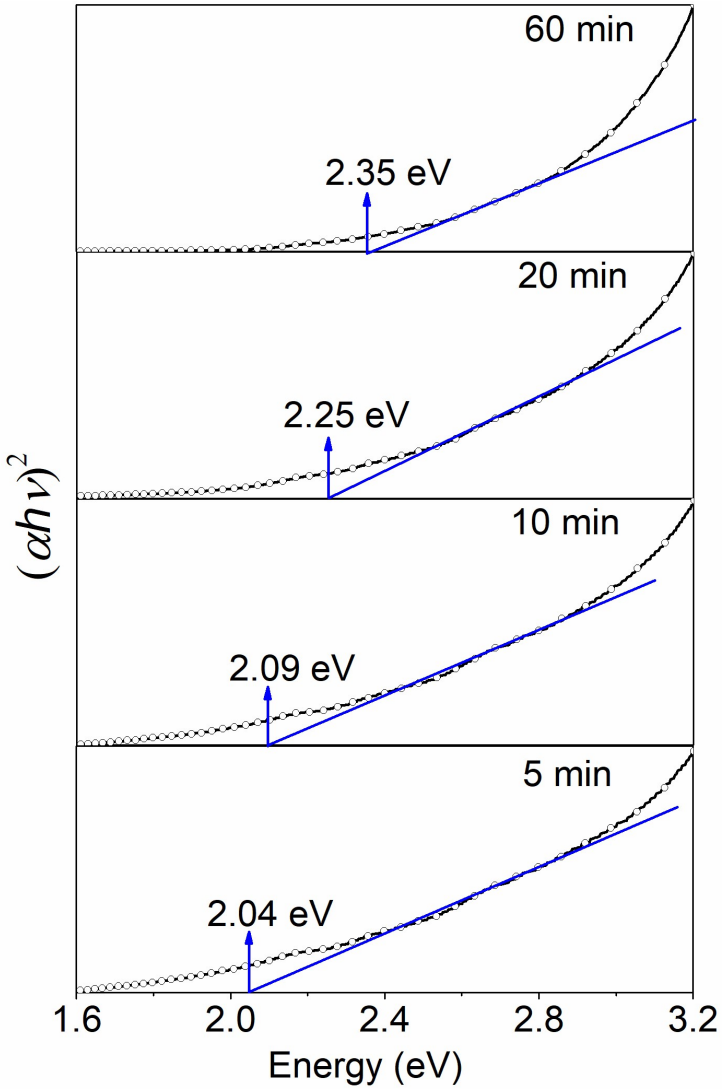


**Figure S5.** The temporal absorption spectra of $AgInS_2$ NCs synthesized from 6.3 nm-sized $Ag_2S$ NCs as seeds, and the optical band gap was estimated by extrapolating the linear portion of the plot of $(\alpha hv)^2$ versus *hv.*

**Figure S6**

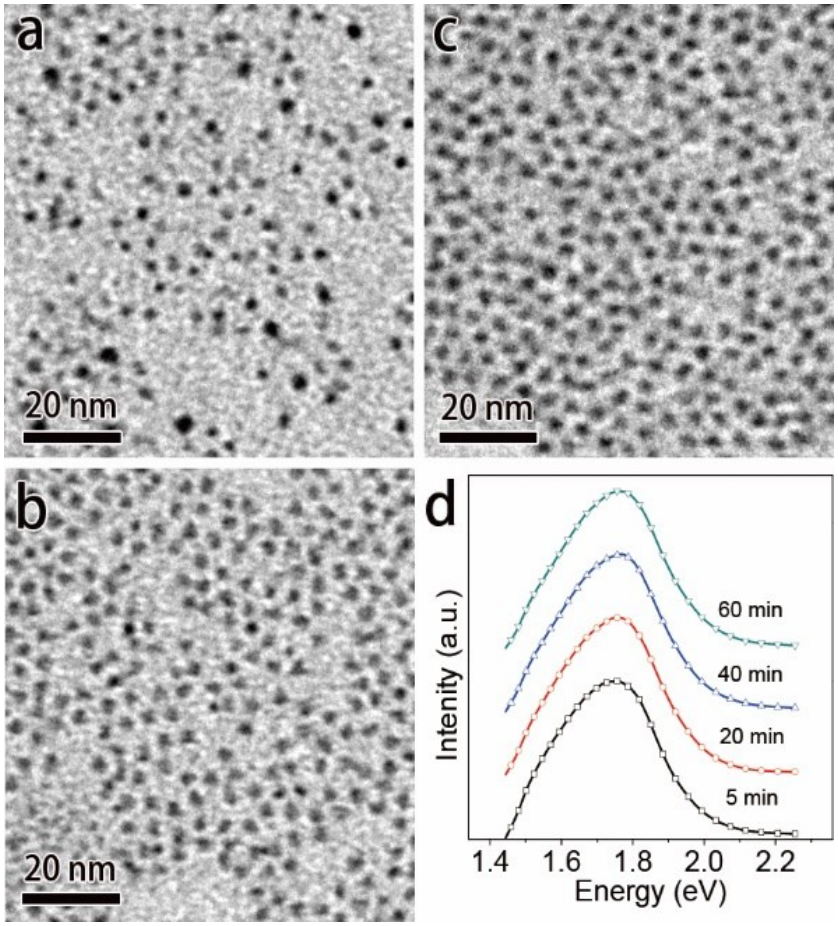


**Figure S6.** TEM images of the AIS NCs synthesized from 3.5 nm-sized $Ag_2S$ NC seeds for different reaction time: (a) 20 min, (b) 40 min and (c) 60 min; (d) the corresponding temporal PL spectra.

**Figure S7**

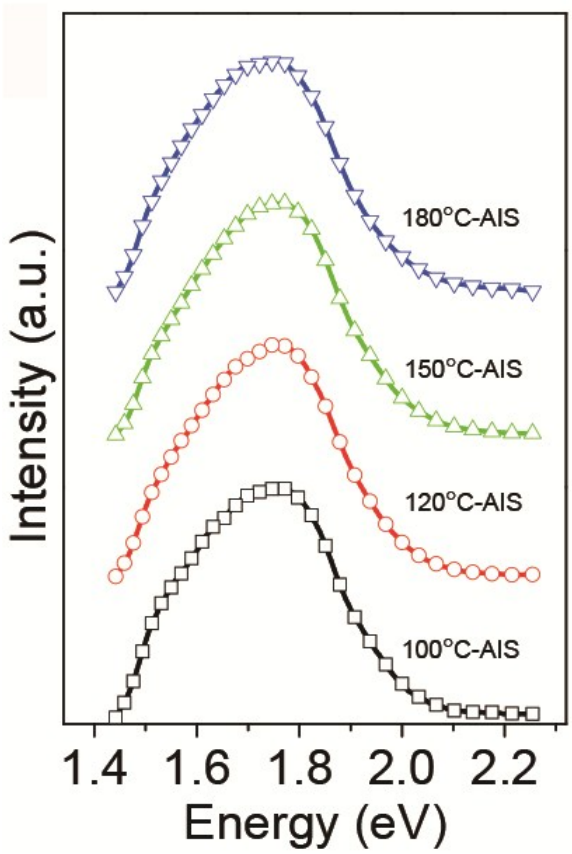


**Figure S7**. PL spectra of the AIS NCs synthesized from 3.5 nm-sized $Ag_2S$ NC seeds under different reaction temperature.

**Figure S8**

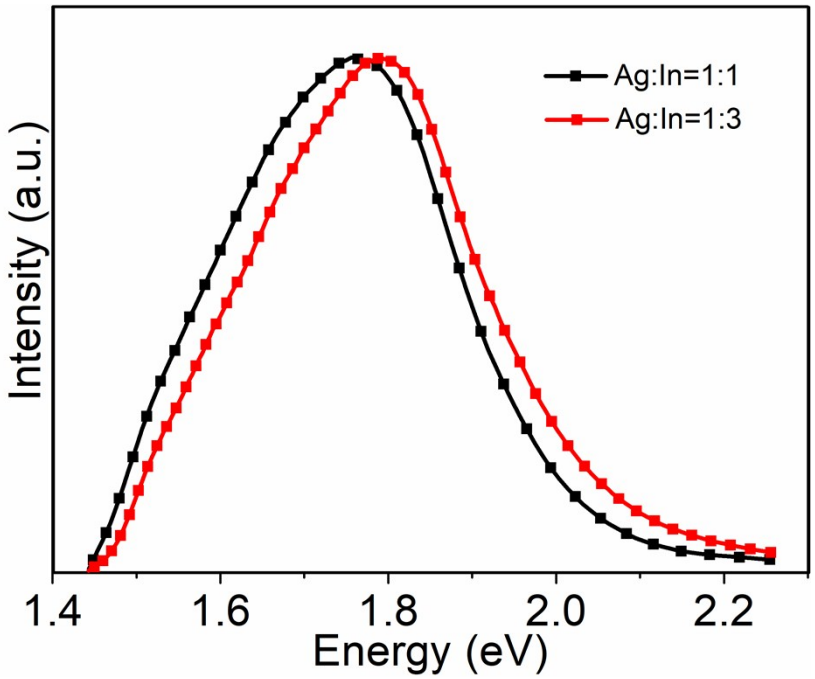


**Figure S8.** PL spectra of AIS NCs synthesized in the presence of different Ag/In feeding ratios.

**Figure S9**

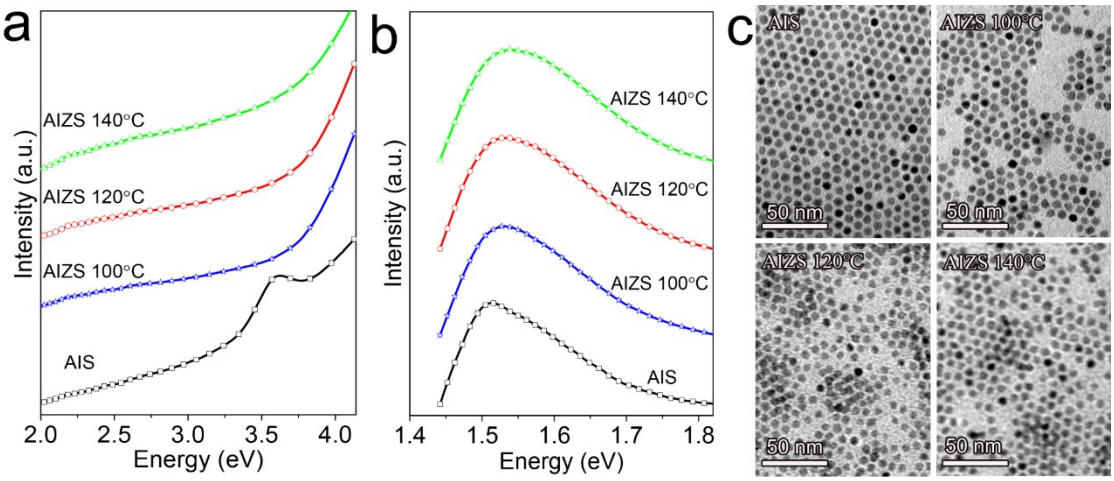


**Figure S9.** (a) Absorption and (b) PL spectra of the AIZS NCs synthesized from 6.6 nm-sized AIS NCs with an orthorhombic phase under different reaction temperature; (c) the corresponding TEM images.

## Figure S10

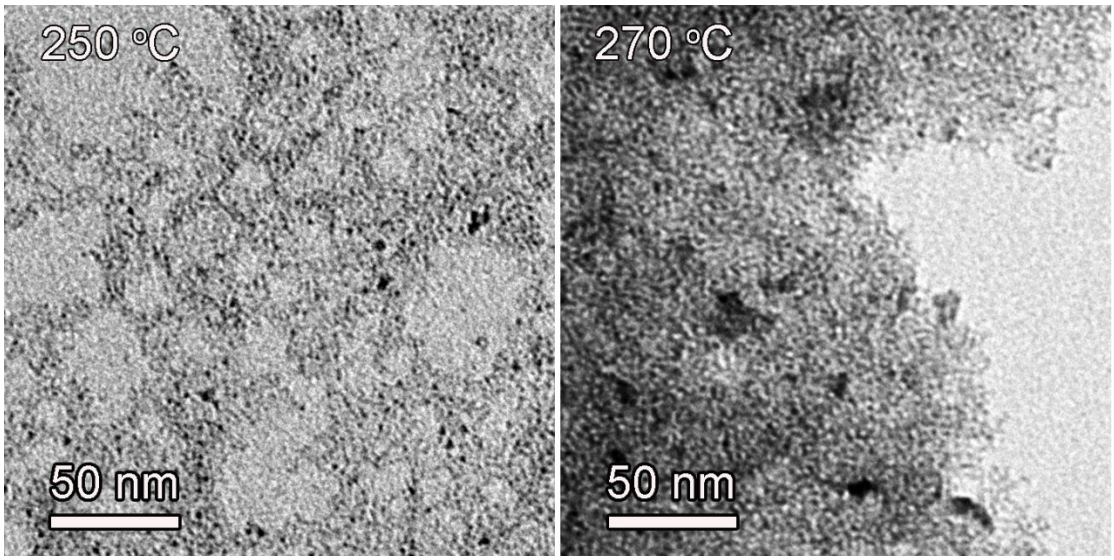


**Figure S10.** TEM images of AIZS obtained at 250 ℃ and 270 ℃.