

Supporting Information

for

Synthesis of stable and phase-adjustable CsPbBr₃@Cs₄PbBr₆ nanocrystals via novel anion-cation reaction

*Leimeng Xu, Jianhai Li, Tao Fang, Yongli Zhao, Shichen Yuan, Yuhui Dong, Jizhong Song**

MIIT Key Laboratory of Advanced Display Materials and Devices
Institute of Optoelectronics and Nanomaterials
School of Materials Science and Engineering
Nanjing University of Science and Technology, Nanjing 210094, China

Email address: Jizhong Song: songjizhong@njut.edu.cn (corresponding author)

Experiment Section

Materials

PbBr₂, CsBr, PDBr, cesium acetate, lead acetate, DMF, DMSO, DDA-Cl, acetonitrile (from Macklin reagent) Cesium stearate (CsSt, 98% pure, from J&K reagent), oleylamine (OAm, 80–90% pure, from Aladdin-reagent), oleic acid (OA, from Aladdin-reagent), 1-octadecene (ODE, >80% pure, from Aladdin-reagent), OAm-I (from Xi'an Baolaite) were used without further purification.

Synthesis of cubic CsPbBr₃ nanocrystals

PbBr₂ (0.6 mmol) and CsBr (0.6 mmol) were dissolved in 10 mL dimethyl sulfoxide (DMSO) solution. OA (0.5 mL) and OAm (0.5 mL) were added to stabilize the precursor solution. Then, 1 mL of the precursor solution was quickly added into 20 mL toluene under vigorous stirring. Strong green-mission crude production was observed immediately after the injection. After reaction for 1 min, 10 mL acetonitrile was added into the green crude solution for purification. The precipitate was dispersed in toluene for further use after centrifugation.

Synthesis of cubic CsPbBr₃ nanocrystals

15 mL of octadecene (ODE), 3 mL of OAm, 1.5 mL of OA, and PbBr₂ (0.2 g) were loaded into a 100 mL four-neck flask, degassed at 100 °C for 10 min, mixed at 100 °C for 30 min, and heated to 170 °C in 10 min under Ar flow. 0.55 mL of Cesium Stearate (CsSt) solution (0.15 M in ODE) was quickly injected. After 5 s, the reaction mixture was cooled by the ice-water bath. The resultant QDs were precipitated by 20 mL of acetone and separated via centrifugation. The separated QDs were redispersed in in toluene for further use.

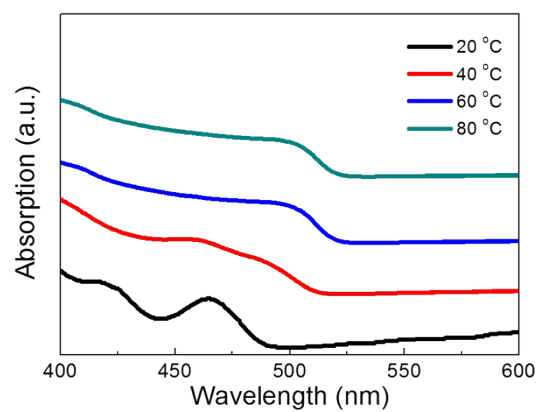


Fig. S1 Absorption spectra of CsPbBr₃@Cs₄PbBr₆ NCs prepared at different temperature.