

Size control of Cs₃Bi₂Br₉ nanoparticles and study of phase transition during synthesis

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In this report, we demonstrate size and shape controlled synthesis of lead-free cesium bismuth bromide (Cs₃Bi₂Br₉) perovskite nanocrystals (NCs). The Cs₃Bi₂Br₉ nanocrystals are synthesized via injection-free, heating up method in presence of high boiling point solvent mixture. Size and shape of Cs₃Bi₂Br₃ NCs are readily controlled by changing reaction condition. Upon heating, sequential phase evolution are observed, which is characterized by transmission electron microscopy (TEM), X-ray diffraction (XRD), and X-ray photoemission spectroscopy (XPS) measurements. In addition, we characterize absorption and photoluminescence properties of Cs₃Bi₂Br₃ NCs investigating size dependent optical properties.