**Atomically Thin Cesium Lead Bromide Perovskite Quantum Wires with High Luminescence**

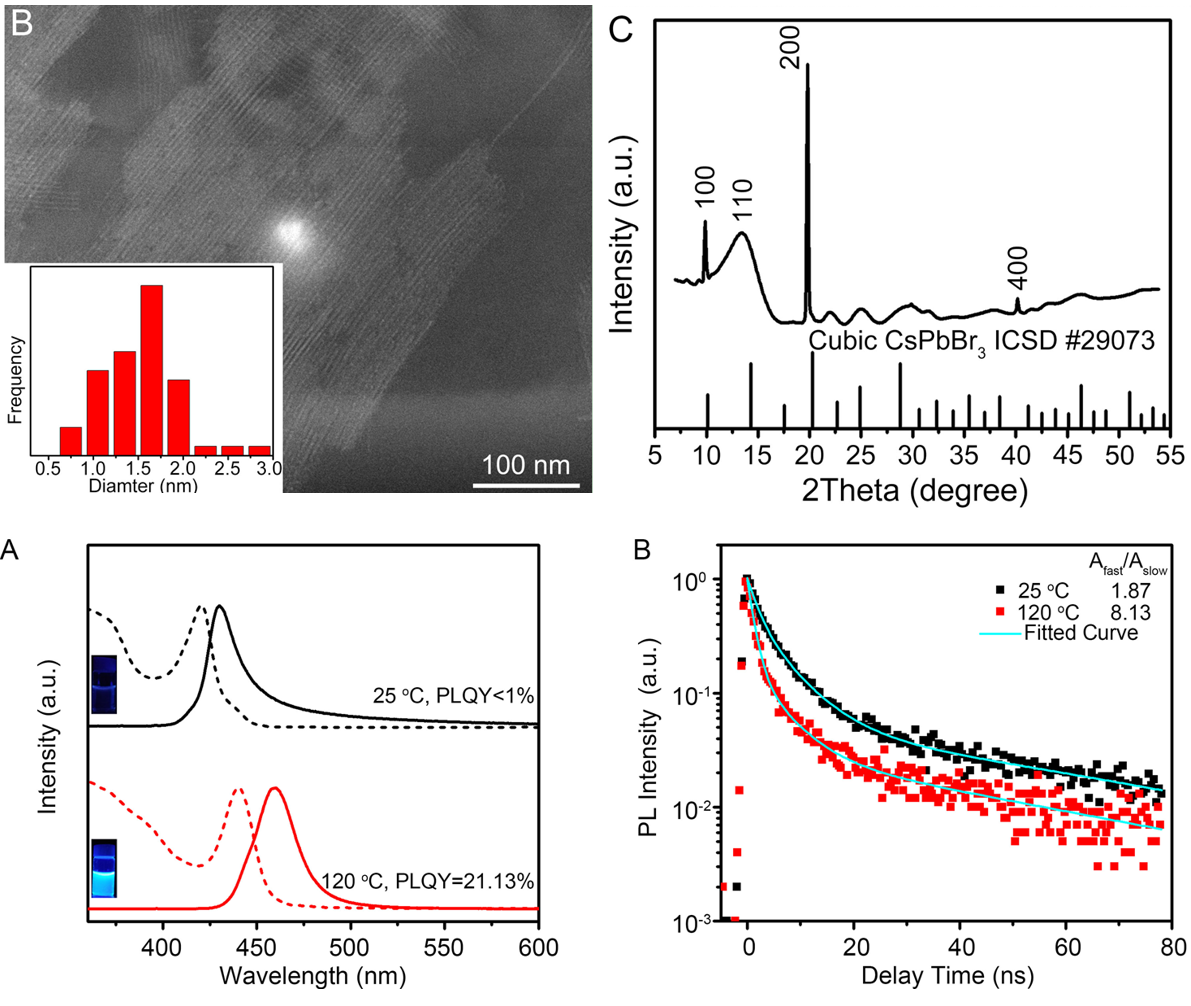
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Unlike the widely known zero-/two-dimensional all-inorganic cesium lead halide perovskite (CsPbX3, X = Cl, Br, I) nanocrystals, one-dimensional (1-D) CsPbX3 quantum wires (QWs) with a strong quantum confinement effect are still unexplored. Here, we report a room-temperature colloidal synthesis of few-unit-cell-thick CsPbBr3 QWs with lengths over a hundred nanometers. Owing to the strong quantum confinement effect, the photoluminescent (PL) emission peak of few-unit-cell-thick CsPbBr3 QWs blue-shifted to 430 nm. Notably, the ensemble PL quantum yield (PLQY) of the few-unit-cell-thick CsPbBr3 QWs increased to 21.13% through a simple heat-treatment process. The improvement of PLQY was ascribed to the reduction of the density of surface trap states and defect states induced by heat-treatment process. In addition, the size-dependent bandgap of 1-D CsPbBr3 QWs was presented for the first time. Such few-unit-cell-thick CsPbBr3 QWs with a high PLQY not only represent a promising candidate for optoelectronic devices, but also provide an ideal platform for a myriad of fundamental studies.



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