

Abstract Submitted
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Temperature dependent photoluminescence and reflectance studies of CsPbBr₃ Quantum Dots.¹ LYALL ALWAFI, GAVIN TREVORROW, University of Michigan-Flint, AMLAN DATTA, CapeSym, Inc., BIPLOB BARMAN, University of Michigan-Flint, UNIVERSITY OF MICHIGAN-FLINT COLLABORATION, CAPESYM, INC. COLLABORATION — Metal halide perovskite-based semiconductor quantum dots (QD) have been extensively studied, as a means to explore potential applications by harnessing their excellent optoelectronic properties. In this work, we used temperature dependent (10 K – 290 K) photoluminescence (PL) spectroscopy, using CW laser (with excitation powers of 0.74 W and 0.16 W) operating at two different excitations wavelengths 3.06 eV and 2.75 eV. The PL emission results in an asymmetric Gaussian which can be decomposed into two peaks at 2.392 eV and 2.410 eV. Besides PL, we also performed temperature dependent reflectance measurements which reinforces the dual emissive nature of these QDs. While the low energy feature is attributed to free exciton emission, the high energy feature could be a result of disorder or imperfection related mechanisms.

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