

Accepted Manuscript

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PII: S0167-577X(17)31013-3

DOI: <http://dx.doi.org/10.1016/j.matlet.2017.06.113>

Reference: MBLUE 22825

To appear in: *Materials Letters*

Received Date: 12 May 2017

Revised Date: 17 June 2017

Accepted Date: 27 June 2017

Please cite this article as: X-D. Liu, Q. Wang, Z-Q. Cheng, Y-H. Qiu, L. Zhou, Q-Q. Wang, Solution-Phase Growth of Organolead Halide Perovskite Nanowires and Nanoplates Assisted by Long-Chain Alkylammonium and Solvent Polarity, *Materials Letters* (2017), doi: <http://dx.doi.org/10.1016/j.matlet.2017.06.113>

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Solution-Phase Growth of Organolead Halide Perovskite Nanowires and Nanoplates

Assisted by Long-Chain Alkylammonium and Solvent Polarity

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Abstract

The solution-phase synthesis of organolead halide perovskite nanowires, nanoplates, and nanoparticles at room temperature is controlled by varying the amount of polar solvent dimethylformamide (DMF) in the presence of long-chain hexadecylammonium (HA). The products exhibit tunable bright emission in the entire visible region (408-733 nm).

Keywords: Perovskite; Nanowires; Nanoplates; Luminescence; Optical materials and properties.

1. Introduction

Lead halide perovskites (such as $\text{CH}_3\text{NH}_3\text{PbX}_3$ and CsPbX_3 , $\text{X} = \text{Cl, Br, I}$) have attracted extensive interests in many optoelectronic applications, including high-efficiency photovoltaic solar cells [1], light-emitting diodes [2], lasers [3], and photodetectors [4]. The promising properties of perovskites are

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