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High performance perovskite light-emitting diodes realized by isopropyl alcohol as green anti-solvent

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Abstract

Organic-inorganic hybrid perovskites (OIHPs) have been emerged as promising emitting materials for light-emitting diodes due to their miraculous optoelectronic properties. In pursuit of high perovskite quality, anti-solvent assisted crystallization (ASAC) is currently one of the most widely used low-energy consumption methods. However, traditional large-volume use of ASAC anti-solvent, such as chlorobenzene (CB), chloroform (CF), are hazardous to both the environment and human beings. Therefore, the development of green solvent for the ASAC will be of great important for the fabrication of perovskite light emitting diodes (PeLEDs) in more sustainable and environmental friendly ways. Herein, we employ a green solvent, isopropyl alcohol (IPA), as anti-solvent in ASAC for the first time, resulting in a high efficient PeLEDs with a maximum luminance of 7960 cd m^{-2} , a current efficiency of 2.2 cd A^{-1} , and a low turn-on voltage of 2 V. Compared to traditional toxicity solvents, IPA based ASAC leads to smoother surfaces and smaller grains of perovskites, while keeping the

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