

Perovskite Nanocrystals in Light Emitting Devices

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Chemically synthesized metal halide perovskite nanocrystals have recently emerged as a new class of efficient light emitting materials which are particularly promising for development of light-emitting diodes (LEDs) [1]. Stability of perovskite-based LEDs is still an issue [2], which can be partially mitigated by proper interface design, such as the use of inter-layer amine terminated carbon dots [3]. As for many other colloidal nanocrystals, proper surface passivation is a key to ensure high colloidal stability and processability of perovskites; this can be achieved by employment of multi-amine chelating ligands [4]. We also show how water-stable CsPbBr₃/Cs₄PbBr₆ nanocrystals with a mixed fluoropolymer shell can be applied for optical temperature sensing [5]. The use of the lead-based metal halide perovskites is also considered as an issue because of the toxicity concerns related to the lead component. To avoid using lead in light-emitting perovskites, co-doping of cerium and bismuth [6], as well as tellurium and bismuth [7] into lead-free double perovskite Cs₂AgInCl₆ nanocrystals is a useful strategy resulting in their improved photoluminescence efficiency.

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