Perovskite Nanocrystals for LED Applications

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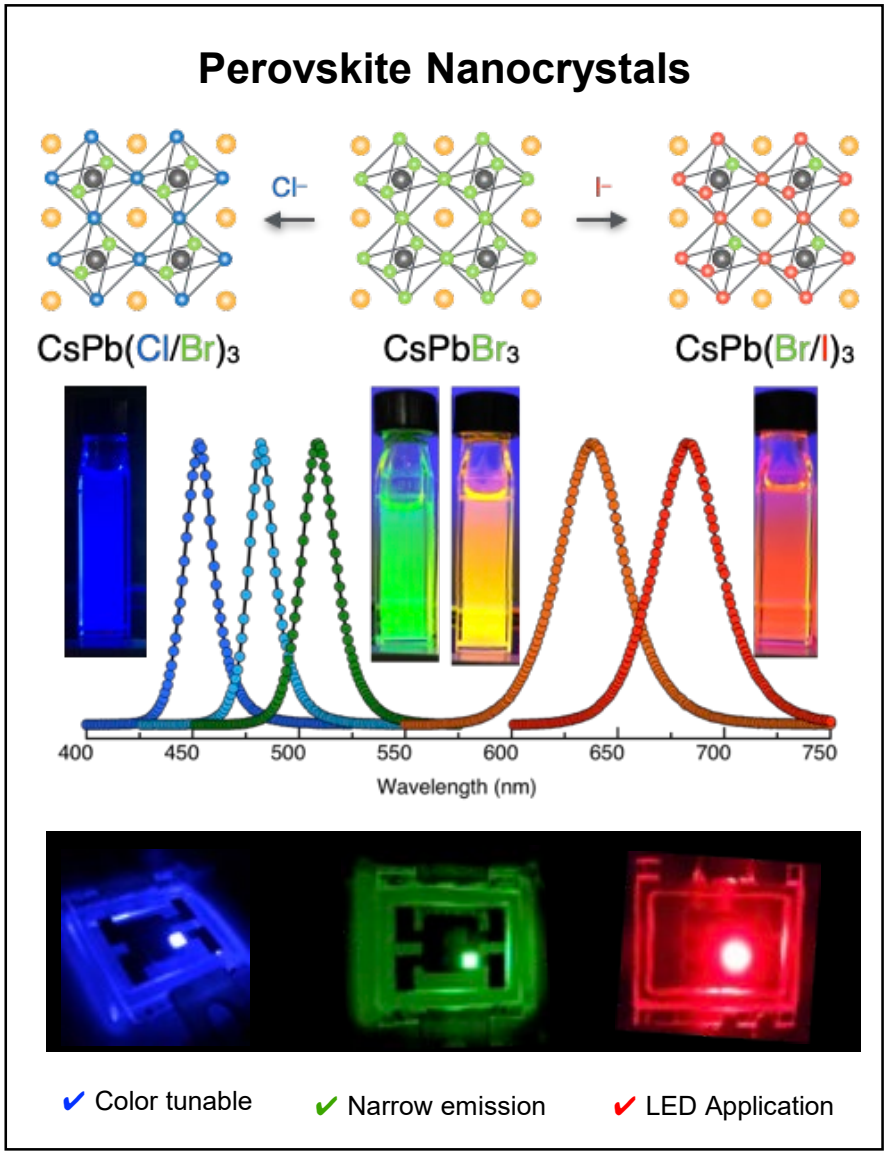

Content:

Perovskites nanocrystals (NCs) have attracted much attention as emerging optoelectronic materials for the application of light-emitting devices (LEDs), owing to the excellent photoluminescence quantum yield (PLQY) and narrow full-width half maximum (FWHM) with wide color gamut in full visible range. In general, perovskite with the chemical formula ABX_3 (A^+ is monovalent cation, B^{2+} is bivalent cation, and X^- is halide anions such Cl^-, Br^-, I^-) NCs, are capped by the long alkyl to achieve colloidal stability in non-polar solvent. The LEDs based on green, red, and near-infrared perovskites have drastically improved the external quantum efficiency (EQE) of over 20% through surface ligand engineering, surface treatments, energy level alignment and by employing a new approach that ensures a halide-rich composition.

We focus on a surface engineering of perovskite NCs, such as ligand exchange, anion exchange and metal doping to achieve high efficiency LEDs.

Appealing point:

Blue perovskite NCs, Lead free perovskite NCs, Highly stable perovskite NCs,

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