

Special Issue

Perovskite Materials and Devices: Past, Present and Future

Message from the Guest Editor

Conventional perovskite is a kind of microcrystalline material with a three-dimensional structure developed based on the natural mineral calcium titanate (CaTiO₃). Recently, the conventional perovskite derivatives of metal halide perovskites have drawn tremendous attention in the preparation of high-performance optoelectronic devices, such as photovoltaics, light-emitting diodes (LEDs), photodetectors, lasers and so on, benefitting from outstanding optical and electrical properties, such as tunable bandgap, high photoluminescence quantum yield (PLQY), long carrier diffusion length, high charge mobility and good solution processability. Great achievements have been made in perovskite photovoltaics and LEDs with high photon-to-current and/or current-to-photon conversion efficiency approaching the theoretical limit. Further, substantial efforts are being made to improve the operational stabilities of perovskite photovoltaics and LEDs for future practical applications, while there is also a concern that the high device performances are mainly achieved with lead-based perovskites. New lead-free perovskites with excellent optoelectronic properties are highly desired.

Guest Editor

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