

Graphene boosts performance of perovskite photovoltaics

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Abstract

Due to their high efficiency, low cost and ease of production, metal halide perovskites such as methyl ammonium lead iodide ($\text{CH}_3\text{NH}_3\text{PbI}_3$) are presently attracting enormous attention as promising candidates for next generation photovoltaics [1]. Owing to their excellent opto-electronic properties, e.g. strong visible light absorption and long charge carrier diffusion length perovskite light harvesting materials are the subject of intense current investigations [2]. We fabricated perovskite solar cells (PSCs) by solution processing with a normal [3] as well as inverted architecture [4] and tested the effect of graphene as electronically active ingredient on device performance. We introduced graphene nano-platelets into the key optoelectronic components of the PSC, i.e. the electron- and hole specific charge extraction layers as well as the perovskite film itself. We observe substantial benefits for the photovoltaic metrics of the PSC that will be presented in my lecture.

References

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