

Investigating the morphology of MAPbI₃-xCl_x highly efficient perovskite solar cells

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Perovskite solar cells offer the opportunity of easy and potentially cheap processing techniques very comparable to other next generation solar cell such as organic and dye-sensitized solar cells. In addition, the optimization of preparation routines has led to power conversion efficiencies (PCE) of over 15 % for solution processed devices. Device performance, however, is strongly linked to film morphology which in turn depends on the applied preparation protocol.

In our present work we have prepared perovskite thin films with an established 2-step synthesis method. We have investigated precursor and perovskite film with GISAXS and observe a strong correlation of lateral crystal sizes before and after conversion which we attribute to constrained crystal growth. Additionally, we find an accumulation of smaller crystals within the film in contrast to the surface.

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