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Fabrication and Characterisation of Two-Step Slot-Die Coated Methylammonium-Formamidinium Lead Iodide Perovskite Solar Cells

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Perovskite solar cells (PSCs) are very promising in contributing in the renewable energy mix of the future. They have high power conversion efficiencies and are made of low-cost materials. Especially in combination with slot-die coating as promising thin-film deposition technique for organic-inorganic hybrid perovskite materials, they offer the chance for a fast and cheap roll-to-roll solar cell production.

In this work two-step slot-die coated lead iodide layers and slot-die coated methylammonium-formamidinium iodide perovskite solar cells have been prepared. Depending on slot-die coating parameters and additives used in the γ -butyrolactone (GBL) containing ink that enhance thin-film formation and optoelectronic properties of the final perovskite semiconductor absorber, morphology changes are observed in the final film. The morphology is investigated by reciprocal (X-ray diffraction) and real-space methods (SEM). Furthermore, the two-step slot-die coated solar cells are produced and characterized via their respective performance parameters.

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