Supplementary Materials

Scalable Slot-die Coating of High Performance Perovskite Solar Cells

James B. Whitaker, Dong Hoe Kim, Bryon W. Larson, Fei Zhang, Joseph J. Berry, Maikel F.A.M. van Hest*, and Kai Zhu*

National Renewable Energy Laboratory, Golden, Colorado 80401, USA

* Corresponding authors: Maikel.van.Hest@nrel.gov; Kai.Zhu@nrel.gov



Figure S1. Effect of varying slot-die coating gap height on the device characteristics. (a) V_{oc} ; (b) J_{sc} ; and (c) FF.



Figure S2. Effect of varying perovskite precursor concentration on the device characteristics. (a) V_{oc} ; (b) J_{sc} ; and (c) FF.



Figure S3. Top view SEM image of spin coated MAPbI₃ perovskite thin films.



Figure S4. Typical X-ray diffraction pattern of slot-die coated MAPbI₃ perovskite thin films.



Figure S5. Typical UV-vis absorption spectrum of slot-die coated MAPbI₃ perovskite thin films.



Figure S6: (a,c,e,g) Forward- and reverse-scan J–V curves and (b,d,f,h) stable power output for PSCs based on slot-die, blade, spin, and spray coated perovskite thin films, respectively. Device data for spray coating reproduced from Uličná *et al.* with permission.²⁹



Figure S7: Effect of the delay time between slot die coating and anti-solvent bathing on the device performance.