

Electrochemical characterization of pen-drawn flexible perovskite solar cells

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Pen drawing using variously functionalized ink materials is an easy way to prepare a variety of functional electrodes having unique properties such as catalytic activity for facile oxygen reduction, oxygen or hydrogen evolution reactions. In this work, a simple pen-drawing method is used to fabricate functional ink-based photoanode and photocathode of the perovskite solar cells (PECs) on a flexible electrode substrate. Both electrodes with interdigitated electrode pattern are directly formed on transparent flexible substrate using perovskite-functionalized graphene-PEDOT and catalyst inks. The surface of the flexible PEC is carefully coated with a waterproof layer concerning that the perovskite is vulnerable to environmental degradation. The electrochemical properties of the PECs are characterized by the cyclic voltammetry, impedance spectroscopy, and scanning electron microscopy. The solar simulator is used to determine photovoltaic parameters such as open circuit potential, short circuit current, fill factor, and energy conversion efficiency of the PECs.