

Enhanced performance of all inorganic strontium incorporated CsPbI₂Br based perovskite solar cells in ambient condition

PAIL JYOTI¹, 홍창국^{2,3,†}

¹Chonnam National University; ²전남대학교; ³응용화학공학부
(hongck@chonnam.ac.kr[†])

In the present study, we fabricated an air processed strontium (Sr²⁺) partially replaced Pb in inorganic CsPbI₂Br based inorganic perovskite solar cells in ambient condition. The morphology, crystallinity, absorption, elemental composition and photoluminescence of the air processed CsPb_{1-x}Sr_xI₂Br were studied systematically. The Sr providing a passivating effect on the surface of the perovskite. The perovskite solar cell using optimal concentration of Sr (x=0.02) doped CsPbI₂Br achieved a 16.54 % power conversion efficiency, open circuit voltage (V_{OC}) of 1.318 V, a short circuit current density (J_{SC}) of 16.30 mAcm⁻² and fill factor (FF) of 77 % which is much higher than controlled CsPbI₂Br based inorganic PVSC. Our thermal analysis results showed an excellent thermal stability of 200 hours at 60 °C thermal annealing. These results would provide a novel pathway to improve highly efficient and stable inorganic PVSCs.