

Bandgap tuning of Formamidinium lead Iodide Perovskite Materials for Highly Efficient Solar Cell

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Recently, solar energy is actively researched because of various environmental problems generated by greenhouse gases. Among them, Perovskite solar cells (PSCs) are getting attention due to their power conversion efficiency (PCE), higher than 20%, and low process cost by solution process. However, PSCs are vulnerable to moisture and heat, also need to be more efficient. One of the ways to achieve higher PCE is to obtain a higher short-circuit current (J_{SC}). The bandgap of Formamidinium lead iodide (FAPbI₃), which have the highest PCE to date in PSCs, can be tuned by substituting part of its ions with others. And narrower bandgap leads higher light harvesting efficiency by absorbing wider wavelength range of light. Higher light harvesting efficiency can make higher J_{SC} and finally, higher PCE is expected when making solar cell device with this material.