Enhancing the stability of perovskite solar cells with a green and low-cost organic additive

26 October 2022

Functional groups of cellulose acetate butyrate (CAB) interact with anions and cations in perovskite (PVK) to significantly improve the device stability by inhibiting the decomposition of perovskite. Credit: Journal of Energy Chemistry

Recently, Junyou Yang and Yubo Luo from the Huazhong University of Science and Technology, in collaboration with Xin Li from the National University of Singapore, published an article titled "Enhancing the stability of planar perovskite solar cells by green and inexpensive cellulose acetate butyrate" in Journal of Energy Chemistry.

A green and low-cost organic additive, cellulose acetate butyrate (CAB), was used to synthesize a high-quality perovskite thin film. The optimized perovskite film with significantly improved crystallinity demonstrated a nearly ten-fold-longer carrier lifetime than the pristine film. Furthermore, the energy level and stability of the optimized perovskite films were improved, leading to the fabrication of an optimized CAB-based device with a champion efficiency of 21.5% compared to the control device (18.2%). In addition, the optimized device could maintain an initial efficiency of more than 90% after aging for 3300 h at a relative humidity of 35%.


Provided by Chinese Academy of Sciences

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