Efficient and Stable Perovskite Solar Cells at KRICT

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Abstract

Current perovskite solar cells (PSCs) intended for commercialization in the near future require both high efficiency and good long-term stability. Most highly efficient PSCs utilize an n-type layer of mesoporous titanium dioxide in an n-i-p device configuration, in which organic conductors are widely used to transport holes into an adjoined metal. Thus far, a variety of efforts have been devoted to achieve a defect-less perovskite film with high-quality morphologies to realize reduced loss-in-potential outcomes and enhanced efficiency levels. In this talk, we will discuss several challenges that need to be addressed in improving the photovoltaic performance and the stability of the perovskite solar cells, i.e. (1) preparation of high crystalline film of (FAPbI3)1-x(MAPbBr3)x with a large grain size and a preferred orientation, (2) development of selective charge-transporting layers (CTL) with a superior stability, (3) interfacial control and energy level matching between the perovskite and the CTLs. We also continue to discuss our understanding of critical issues for realizing a long-term operating stability of PSCs in terms of the ion migration and the solid encapsulation. Our strategy as presented in this work will offer new directions for those involved in the fabrication of highly efficient and stable PSCs

Keywords: *perovskite solar cells, high efficiency, stability*

Biography

Jangwon Seo is principal scientist at Division of Advanced Materials, Korea Research Institute of Chemical Technology (KRICT). He received his B.S., M.S. and Ph.D. from Seoul National University in 1998, 2000 and 2006, respectively. He worked at University at Buffalo, the State University of New York, from 2007 to 2012 as postdoctoral researchers. He works as senior/principal scientist of inorganic-organic hybrid solar cell team at KRICT since 2013.