

Perovskite Solar Cells

Keywords : Perovskite, High efficiency, Durability

Back-ground

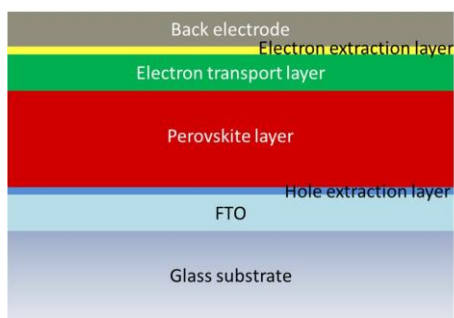
With today's intensive focus on global-scale environmental and energy problems, solar cells have attracted great interest as one form of renewable energy. In order to reduce electric generation costs and rapidly spread solar cells, it is necessary to develop new solar cells with low manufacturing costs.

Aim

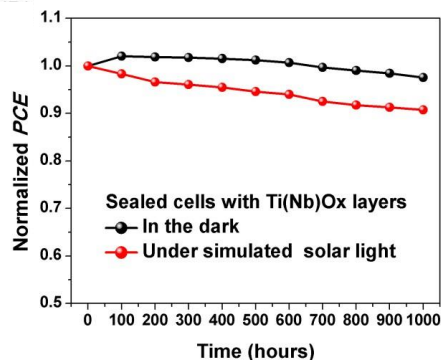
Perovskite solar cells have attracted great interests as a next-generation photovoltaics due to their simple structures and low manufacturing costs. Researches for materials and cell structure are carried out for Improvement of the energy conversion efficiency and long term durability.

Advanced Research Topics

- Achieving the world record for the highest efficiency in perovskite solar cells
- Development of new materials for electron or hole extraction layers
- Development of perovskite material with high reproducibility
- New strategy for high efficiency and durability of PSCs



Structure of invert perovskite solar cells



Excellent durability for light soaking test

Publications

- L. Han, et al., *Energy Environ. Sci.*, 7, 2963 (2014)
- L. Han, et al., *Energy Environ. Sci.*, 8, 629 (2015)
- L. Han et al., *Adv. Mater.* 27, 4918 (2015)
- L. Han et al., *Science*, 350, 944 (2015)

Summary

- Obtaining the world top level technologies to achieve higher efficiency
- Acquiring technologies to develop novel materials to improve efficiency
- Elucidating electron transfer mechanisms

Research outcome

- Achieving higher efficiency over Si solar cells
- Accelerating commercialization of low-cost solar cells
- Creating new market by new type of solar cells



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