

A hybrid perovskite material and a thermochromic photovoltaic cell utilizing the hybrid perovskite material

A method for forming a hybrid perovskite material is described.

The method includes mixing of methyl ammonium iodide ($\text{CH}_3\text{NH}_3\text{I}$) with lead thiocyanate ($\text{Pb}(\text{SCN})_2$) in Dimethyl formamide (DMF) solvent in a molar ratio of n:1 to form a thiocyanate doped non-stoichiometric methyl ammonium lead tri-iodide ($(\text{CH}_3\text{NH}_3)_n\text{PbI}_{3-x}\text{SCN}_x$).

The n in the $(\text{CH}_3\text{NH}_3)_n\text{PbI}_{3-x}\text{SCN}_x$ varies between 5 and 6.

The thiocyanate doped non-stoichiometric methyl ammonium lead tri-iodide exhibits a thermochromic behavior as well as a photovoltaic behavior when temperature reaches above 45°C .

The hybrid perovskite material may be used as an absorber layer in a thermochromic photovoltaic cell.

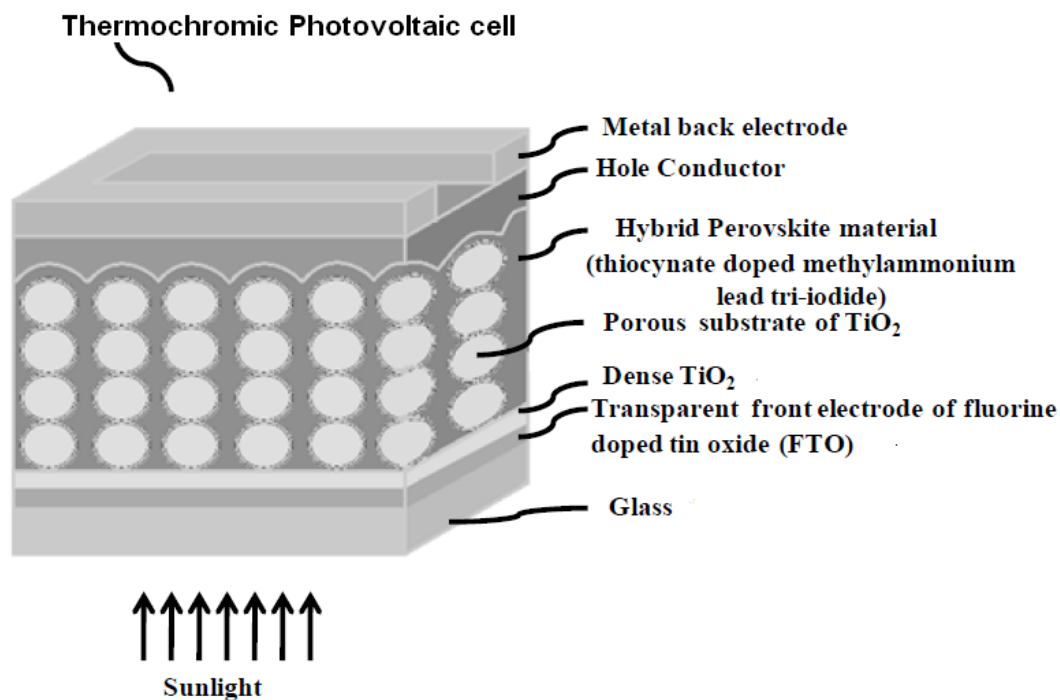


Fig -1: A thermochromic photovoltaic cell utilizing the thiocyanate doped non-stoichiometric methyl ammonium lead tri-iodide 15 as an absorber layer