Séminaire

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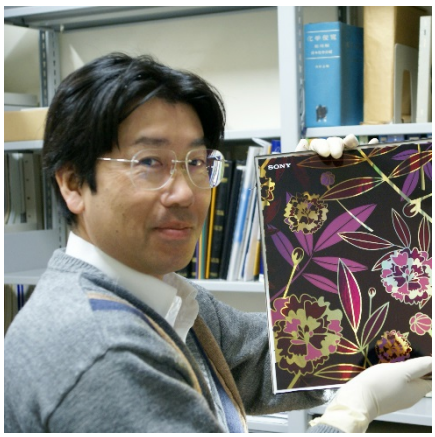

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Perovskite Solar Cells: Crystal Structure and Interface Architecture

Perovskite solar cells based on CH3NH3PbI3 have attracted enormous attention in the last few years due to the outstanding performance as photovoltaics. The power conversion efficiency (PCE) of the devices has dramatically improved to over 20% in relatively short time. Despite the unique properties and higher efficiencies, several important issues, mysterious hysteresis in I-V curves and durability of stabilized performance, still remained for the commercialization.

Here we found that an equivalent circuit model with a series of double diodes, capacitors, shunt resistances, and single series resistance produces the simulate I-V curves with large hysteresis matching with the experimental observed curves. The electrical capacitances generated by defects due to the lattice mismatch at the TiO2/CH3NH3PbI3 and CH3NH3PbI3/spiro-OMeTAD interface are truly responsible for the hysteresis in the perovskite solar cells.

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