Research Center for Photovoltaics

蒸着による有機鉛ペロブスカイトの製膜と特性評価

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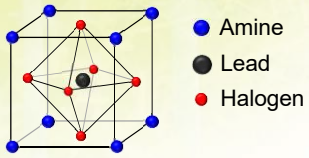
研究の目的

有機鉛ペロブスカイト

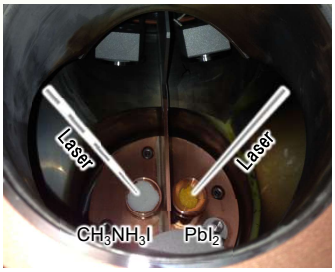


Focus of this study Fundamental issues in perovskite solar cells.

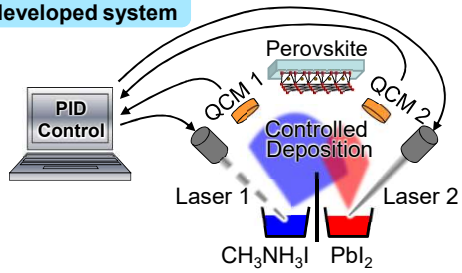
Laser deposition method
Development of highly controlled deposition method.

Hysteresis analysis
Transient analysis to get the clue for the origin of hysteresis.

結果



In-house developed system

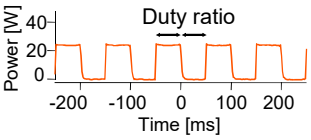


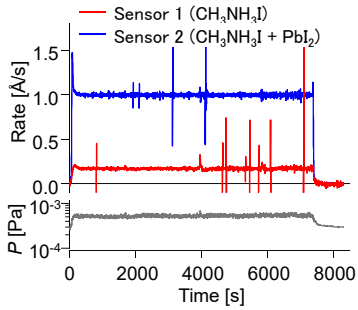
Laser parameters

808 nm semiconductor laser

PbI_2
Continuous wave (power ~10 W)

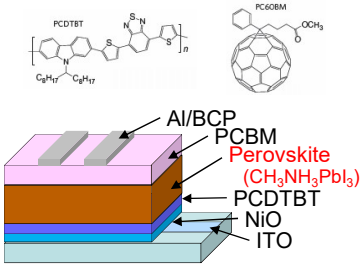
CH_3NH_3I
Modulated wave (power ~20 W)
Deposition rate is adjusted by varying the duty ratio of the pulse.

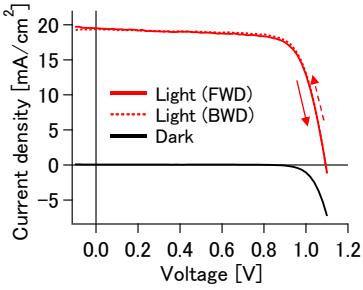




Deposition rate control
Reduced vaporization

OPV-type architecture





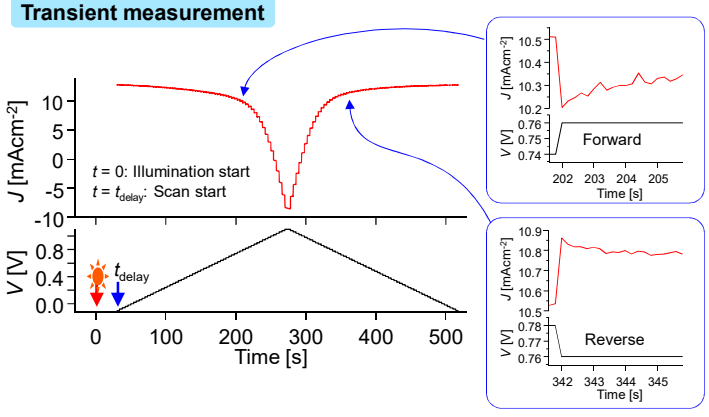
	FWD	BWD	
J_{sc}	19.5	19.3	mA/cm²
V_{oc}	1.09	1.09	V
FF	0.736	0.760	
PCE	15.7	16.0	%

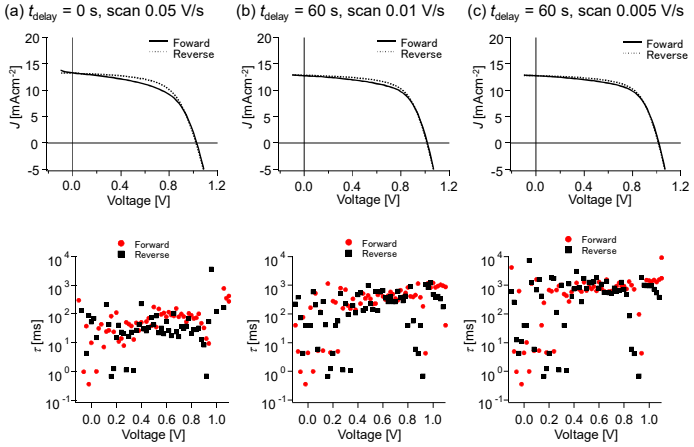
T. Miyadera, *et al.*, *ACS Appl. Mater. Interfaces*, 2016, **8**, pp 26013–26018.
Patent: PCT/JP2015/73596.

考察

How can we interpret scan-rate dependent hysteresis?

Transient measurement





T. Miyadera, *et al.*, *Electrochemistry*, in press.

謝辞

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