Electronic Supplementary Material (ESI) for RSC Advances.
This journal is © The Royal Society of Chemistry 2015

Supplementary materials

High Performance Perovskite Solar Cells by a Vapor Based Method with Optimized PbI_2 Precursor Films

Yanke Peng[1*], Gaoshan Jing[1*], Tianhong Cui[1, 2*]

[1]State Key Laboratory of Precision Measurement Technology and Instruments, Department of Precision Instruments, Tsinghua University, Beijing, 100084, China

[2]Department of Mechanical Engineering, University of Minnesota, Minneapolis, Minnesota 55455, USA

Testing platform for solar cell long term stability measurement

A PMMA sealed box is used to maintain the humidity at a constant value when the solar cell is heated. The heater module (TC-48-20, TE technology, INC., Traverse city, USA) was used to main the heating temperature at a constant value. Temperature control accuracy of this testing platform is ±1°C. Humidity control accuracy of this testing platform is ±3% (relative humidity).

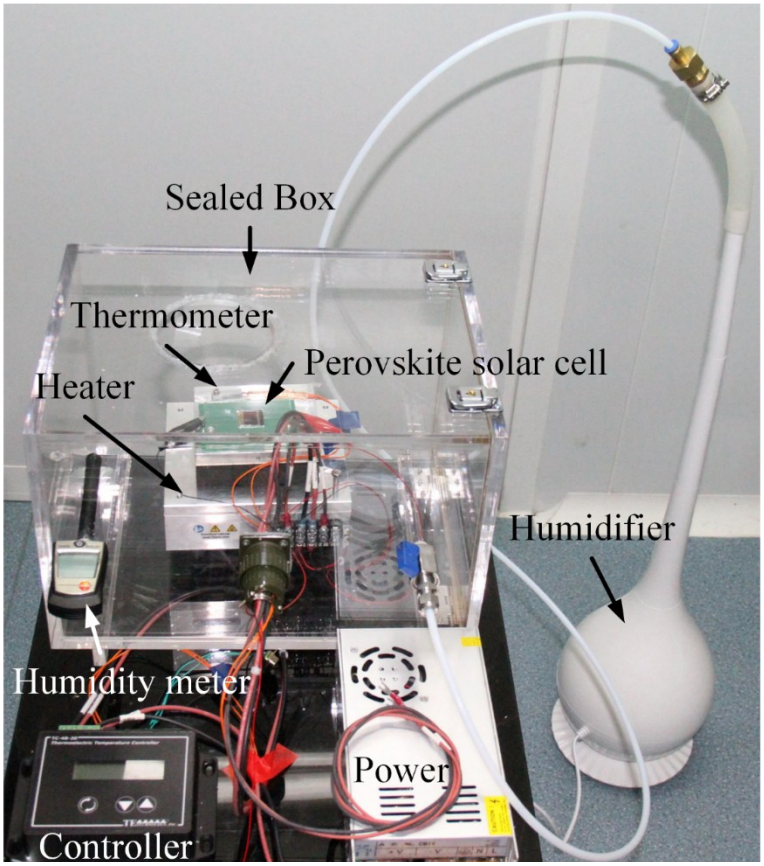

Figure S1. Testing platform for perovskite solar cell long term stability measurement

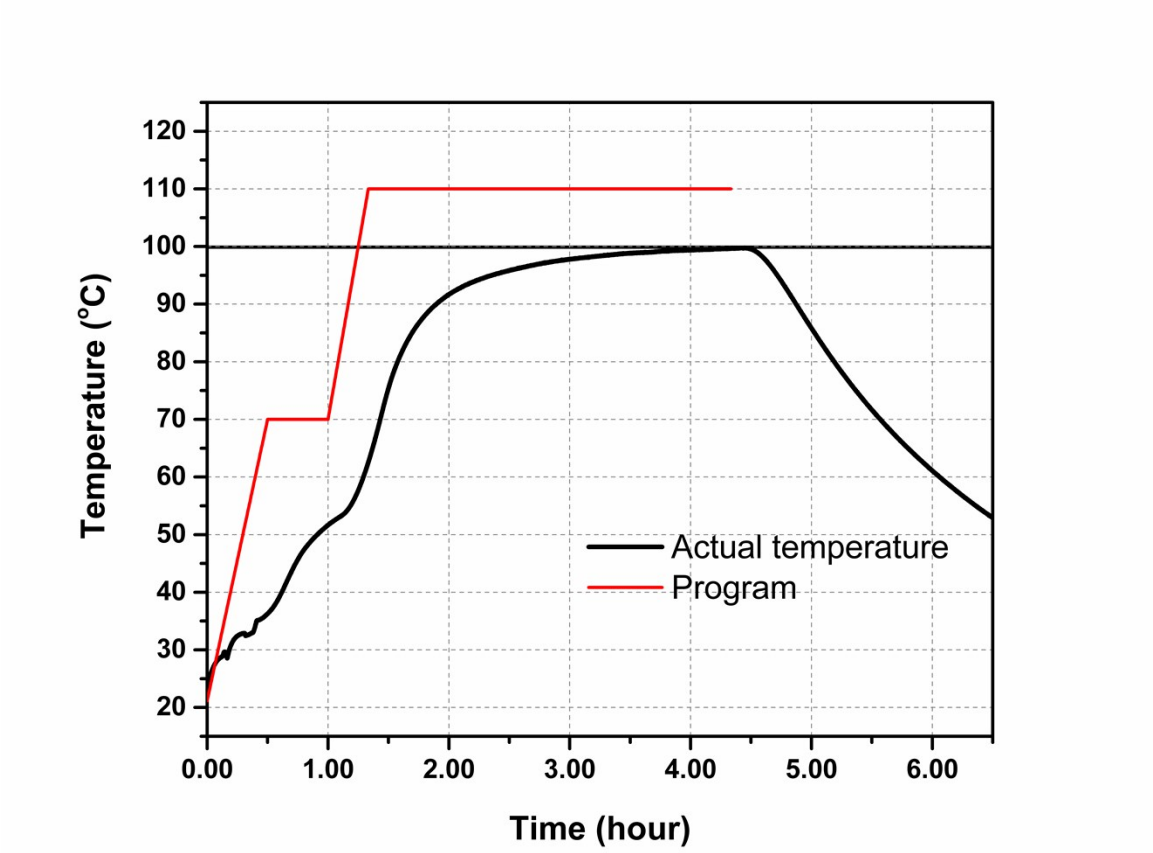

Figure S2. Actual temperature curve in the quartz recorded by a wireless thermometer when the furnace heating up program was set as: 30 min to heat up from the room temperature to 70 °C, maintaining for 30 min, taking 20 min to heat up to 110 °C, maintaining for three hours, then end the program. Finally, the quartz tube cooled down to the room temperature.

Table S1. Statistics of ten HPCVD solar cells before and after heat-treated at 80 °C for 50 h and 96 h.

No.	J_{SC} (mA cm^{-2})	V_{OC} (V)	FF	PCE (%)
Before treatment				
Avg.	**16.55**	**0.96**	**0.54**	**8.9**
1	18.80	0.97	0.63	11.8
2	16.60	0.95	0.50	8.1
3	15.70	0.95	0.51	7.8
4	16.70	0.97	0.47	7.8
5	17.10	0.98	0.49	8.5
6	17.60	0.96	0.58	10.1
7	16.30	1.01	0.59	10.0
8	19.00	0.89	0.56	9.8
9	12.30	0.98	0.54	6.7
10	15.40	0.91	0.54	7.8
After heated at 80 °C for 50 h				
Avg.	**16.06**	**0.94**	**0.51**	**7.9**
1	18.90	0.95	0.52	9.6
2	16.60	0.95	0.50	8.1
3	14.40	0.92	0.33	4.5
4	16.00	0.96	0.47	7.4
5	15.50	0.95	0.53	8.0
6	17.60	0.96	0.57	9.9
7	16.30	0.97	0.60	9.8
8	19.30	0.89	0.51	9.0
9	10.60	0.90	0.49	4.8
10	15.40	0.91	0.54	7.8
After heated at 80 °C for 96 h				
Avg.	**14.53**	**0.92**	**0.48**	**6.9**
1	14.00	0.90	0.49	6.4
2	15.20	0.91	0.45	6.4
3	10.90	0.88	0.31	3.1
4	15.60	0.98	0.47	7.4
5	14.10	0.96	0.49	6.8
6	17.10	0.97	0.58	9.9
7	16.10	1.00	0.61	10.1
8	17.20	0.82	0.53	7.7
9	11.70	0.92	0.44	4.9
10	13.40	0.89	0.47	5.8