

Supporting Information

Controllable Preparation of Rutile TiO₂ Nanorods Array for Enhanced Photovoltaic Performance of Perovskite Solar Cells

Shufang Wu,[†] Chi Chen,[†] Jinming Wang,[†] Jiangrong Xiao,^{*‡} and Tianyou Peng^{*†}

[†]College of Chemistry and Molecular Sciences, Wuhan University, Wuhan 430072, P. R. China

[‡]College of Urban Construction, Wuchang Shouyi University, Wuhan 430070, P. R. China

Corresponding Authors: Tianyou Peng
Jiangrong Xiao

*E-mail: typeng@whu.edu.cn (T. P).
xiaojjrr@126.com (J. X).

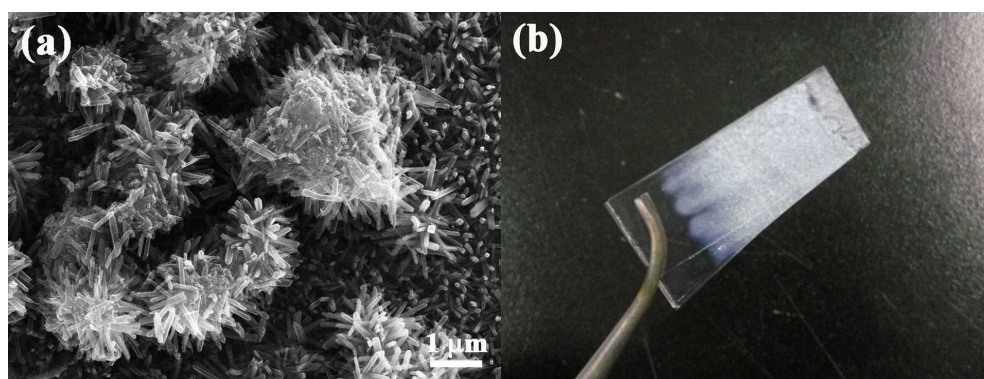
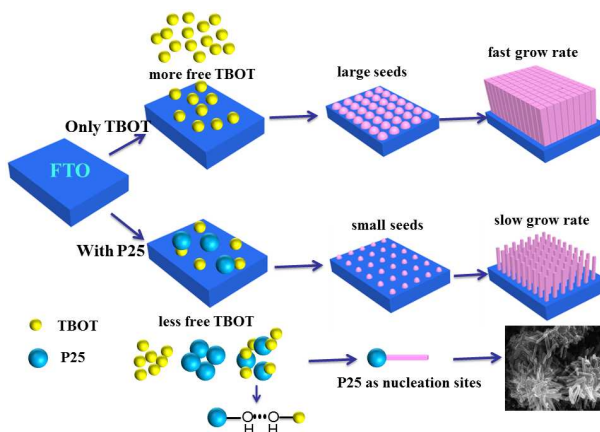


Figure S1. (a) FESEM image of the product derived from hydrothermally treating a mixture (0.5 mL of TBOT + 0.1 g P25) at 150 °C for 4 h. (b) Photo of the product derived from hydrothermally treating a mixture (0.5 mL of TBOT + 0.5 g P25) at 150 °C for 4 h.



Scheme S1. The growth processes of rutile TiO_2 nanorods on FTO substrates without and with P25.

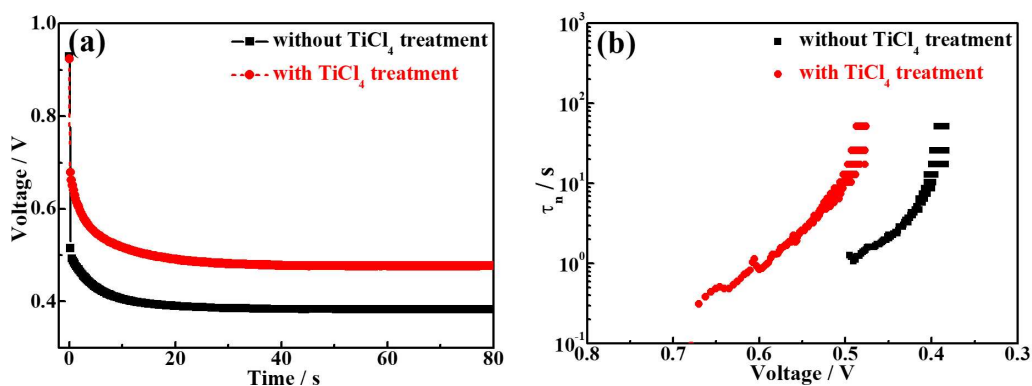


Figure S2. Open-circuit voltage decay (OCVD) (a) and τ_n - V_{oc} (b) curves of the PSCs fabricated with NRs-3 film derived from hydrothermal treatment for 3 h with or without TiCl_4 post-treatment.

Table S1. Performance Parameters of the PSCs Fabricated with NRs-1 Films**Derived from Different Reaction Times**

time (h)	thickness (nm)	diameter (nm)	J_{sc} (mA cm ⁻²)	V_{oc} (V)	FF (%)	PCE (%)
1	----	10	17.8	0.93	26	4.2
2	750	78	21.2	0.92	52	10.3
3	1300	115	20.7	0.86	50	8.9
4	2400	200	19.7	0.83	42	6.9

Table S2. Performance Parameters of the PSCs Fabricated with NRs-2 Films**Derived from Different Reaction Times**

time (h)	thickness (nm)	diameter (nm)	J_{sc} (mA cm ⁻²)	V_{oc} (V)	FF (%)	PCE (%)
1	550	105	22.1	0.92	50	10.2
2	2500	230	19.9	0.83	46	7.6
3	4000	----	18.3	0.69	45	5.7
4	7500	----	15.8	0.67	29	3.1

Table S3. Performance Parameters of the PSCs Fabricated with NRs-3 Films**Derived from Different Reaction Times**

time (h)	thickness (nm)	diameter (nm)	J_{sc} (mA cm ⁻²)	V_{oc} (V)	FF (%)	PCE (%)
1	500	60	20.3	0.92	52	9.7
2	800	76	19.5	0.91	60	10.6
3	1100	105	22.4	0.91	63	12.9
4	1250	125	20.9	0.86	57	10.2