Low-Temperature Chemical Sintered TiO_2 Photoanodes Based on a Binary Liquid Mixture for Flexible Dye-Sensitized Solar Cells

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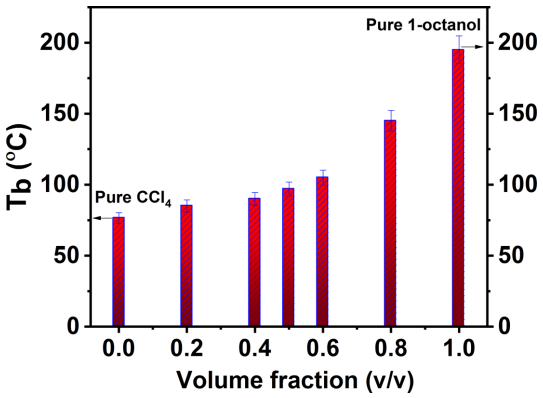

Fig. S1. Variations of the boiling points of CCl_4 and 1-octanol mixture against their volume fractions.

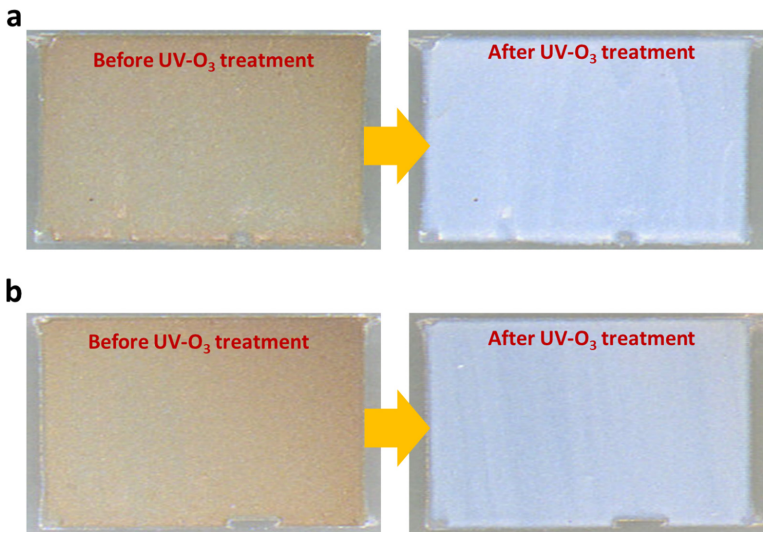

Fig. S2. Photographic images of the 150°C sintered TiO_2 films prepared using (a) $\mathbf{P_{BL}}$ and (b) $\mathbf{P_O}$ before and after UV-O_3 treatment.

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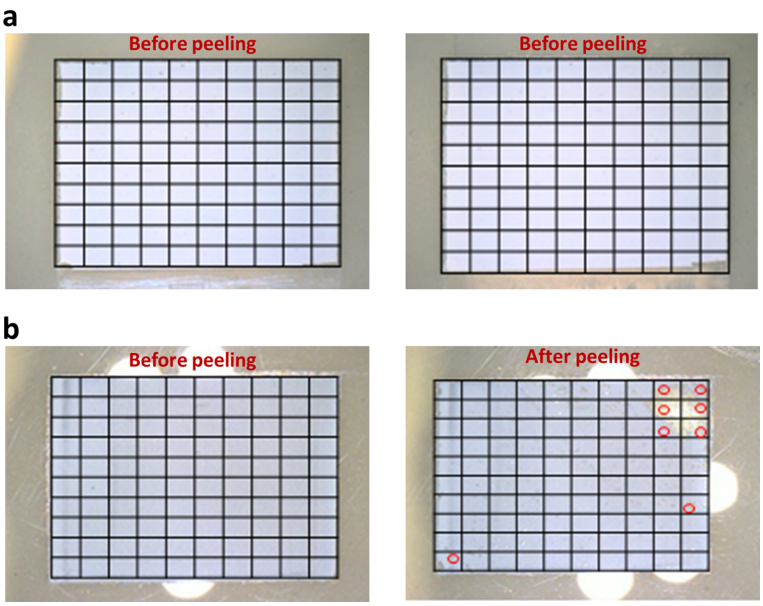

Fig. S3. Photographic images of TiO_2 films prepared using (a) $\mathbf{P_{BL}}$ and (b) $\mathbf{P_O}$ pastes before and after scotch tape scratch test. The TiO_2 films were prepared by doctor method onto glass/FTO substrates and sintered at 150°C followed with the subsequent UV-O_3 treatment.

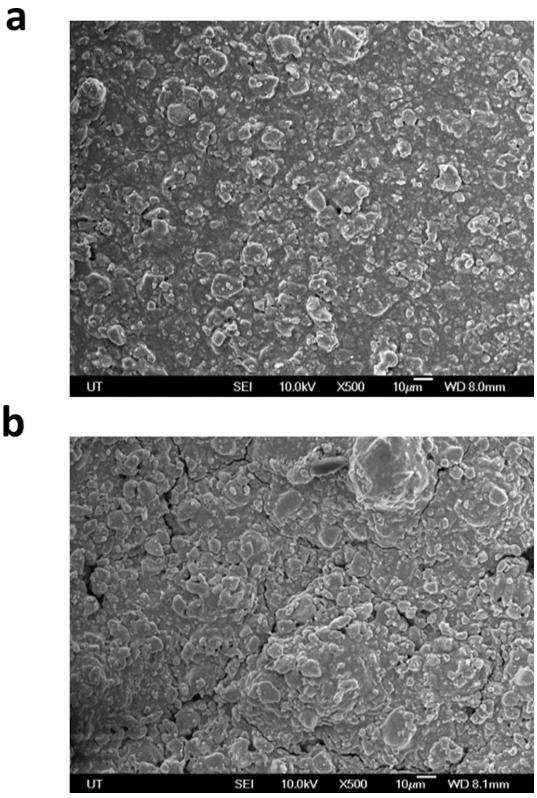

Fig. S4. FE-SEM images of room temperature dried TiO_2 films prepared using (a) $\mathbf{P_{BL}}$ and (b) $\mathbf{P_O}$ pastes.

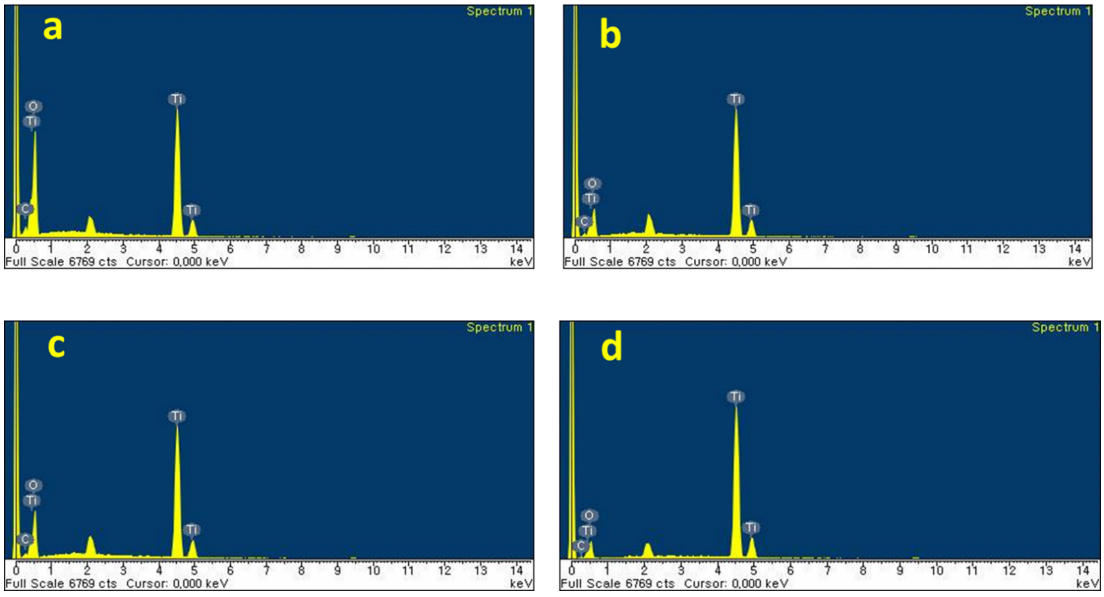

Fig. S5. EDS spectra of $\mathbf{P_{BL}}$ TiO_2 film at different treatment conditions: (a) 25°C, (b) 150°C, (c) 150°C+ UV-O_3, and (d) 500°C.

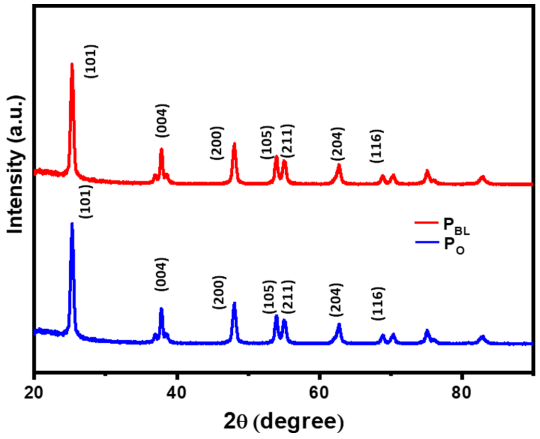

Fig. S6. XRD pattern of $\mathbf{P_{BL}}$ and $\mathbf{P_O}$ TiO_2 films sintered at 150°C followed with the subsequent UV-O_3 treatment.

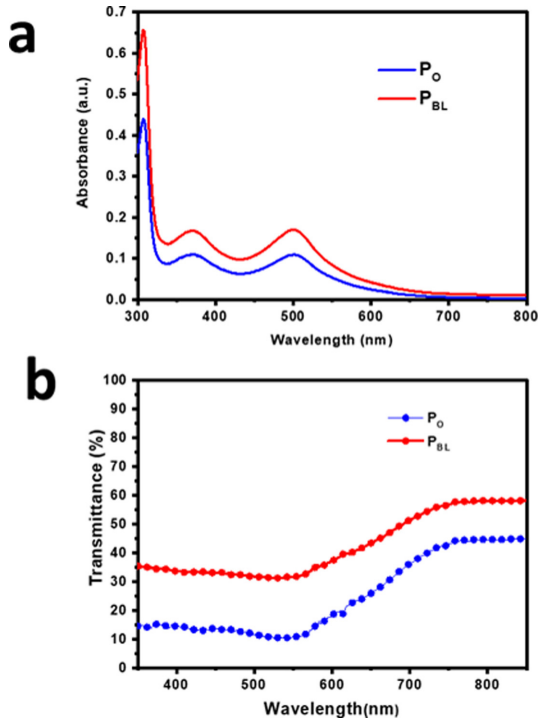

Fig. S7. (a) UV-vis absorption spectra of N719 dye detached from the dye-anchored TiO_2 film of $\mathbf{P_{BL}}$ and $\mathbf{P_O}$ in 0.1 M $NaOH_{(aq.)}$. (b) Transmittance spectra of $\mathbf{P_{BL}}$ and $\mathbf{P_O}$ TiO_2 films sintered at 150°C with the subsequent UV-O_3 treatment.

Table S1. Comparison PCE of previously reported low-temperature TiO_2 pastes based DSSCs.

Chemical sintering agents	Photoanode Substrates	CE substrates	Type of full device	Sintering Temp (^oC)	PCE (%)	Ref.
Mixture of water, t-butanol	ITO/PEN	FTO/glass	Rigid	150	5.8	S1
Nanoglue	ITO/PEN	FTO/glass	Rigid	150	5.43	S2
HCl	ITO/PEN	ITO/PEN	Flexible	150	5.0	S3
Zn NPs	FTO/glass	FTO/glass	Rigid	200	4.92	S4
H_2TiF_6	ITO/PET	FTO/glass	Rigid	120	4.2	S5
NH_4OH	ITO/PET	ITO/glass	Rigid	150	5.44	S6
CH_3COOH and NH_4OH	FTO/glass	FTO/glass	Rigid	150	2.55	S7
Binary-Liquid	Glass/FTO	Glass/FTO	Rigid	150	6.0	This work
	ITO/PEN	ITO/PEN	Flexible	150	3.5	

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