SUPPPORTING INFORMATION

Monolithic 2D Photonic Crystal Reflectors for the Fabrication of Highly Efficient and Highly Transparent Dye-sensitized Solar Cells

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Table S1. Comparative list of change of transmittance and photovoltaic parameters of previous 1D and 3D PC electrodes for use in DSCs.

Ref.	Thickness	T decrease DR increase	Photovoltaic parameters Jsc(mA/cm^2) (Jsc increase)	Photovoltaic parameters Efficiency (%) (Eff. increase)
1D [1]	800 nm	- 50% (+ 70%)	7.85 (29%)	3.23 (18%)
3D [2]	6 μm	- 10% (+ 20%)	-	-
1D [3]	1 μm	- (+ 60%)	9.24 (24%)	3.3 (30%)
3D [4]	8 μm	- 50% (+ 20%)	13.98 (40%)	6.46 (40%)
1D [5]	~5 μm	- 30% (+ 35%)	7.8 (30%)	3.5 (17%)
3D [6]	5 μm	(+ 40%)	10.26 (60%)	3.2 (37%)
3D [7]	5 μm	(+ 40%)	11.6 (200 %)	5.7 (90%)

3D[8]	1.4 µm	- 50%	4.7 (10%)	2.0 (10%)
1D[9]	700nm	- 10% (+ 25%)	10 (25%)	4.5 (13%)

Table S2. Size parameters of 2D PCs with various nanopillar heights.

Sample	Etching time	Diameter	Height	Lattice distance	Filling fraction
2D PC (h = 150 nm)	5 min.	480 nm	150 nm	550 nm	0.87
2D PC (h = 430 nm)	10 min.	380 nm	430 nm	550 nm	0.69
2D PC (h = 750 nm)	15 min.	240 nm	750 nm	550 nm	0.44

Table S3. Dye adsorption density of 2D PC with various nanopillar heights.

bare	2D PC(h=150nm)	2D PC(h=430nm)	2D PC(h=750nm)
0.1676 μmol/cm^2	0.1674 μmol/cm^2	0.1667 μmol/cm^2	0.1622 μmol/cm^2

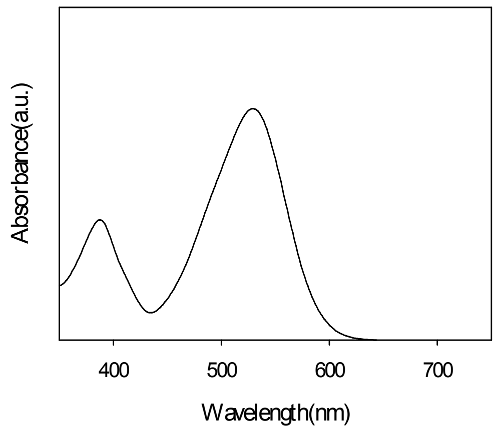

Figure S1. Absorbance of D205 dye.

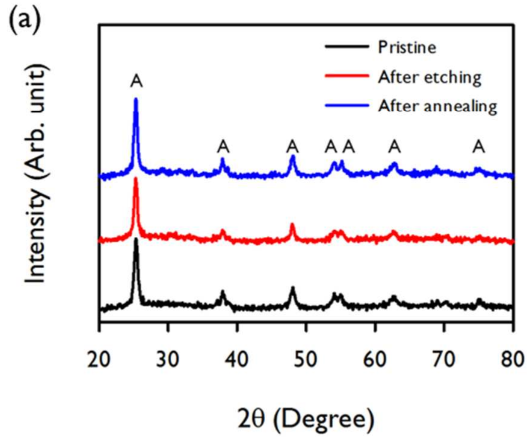

Figure S2. XRD results of nanocrystalline TiO_2 without and with RIE or calcination treatment.

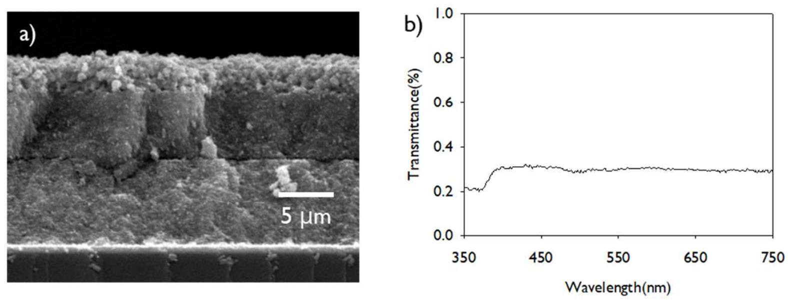

Figure S3. Cross-sectional SEM image of conventional particulate scattering layer.

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