Supporting Information

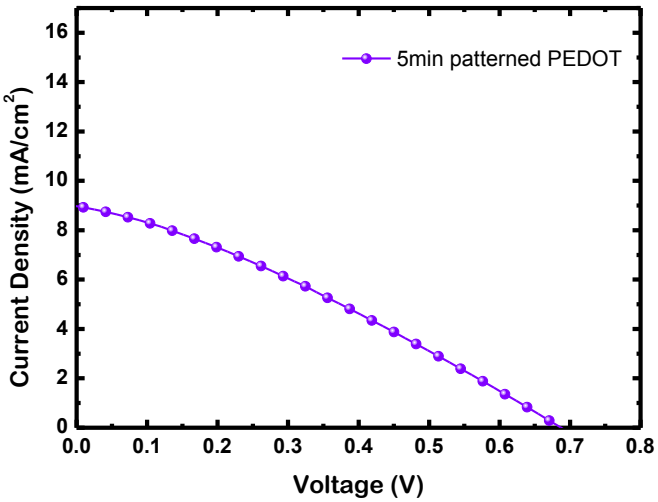

Figure S1. I-V curve of DSSC with CE with 5 min polymerized PEDOT film on the PS pattern

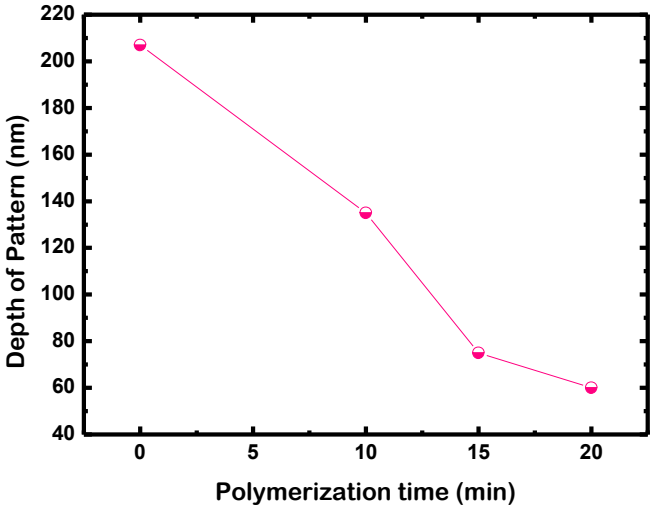

Figure S2. Depth of PEDOT nanopatterns with different polymerization time.

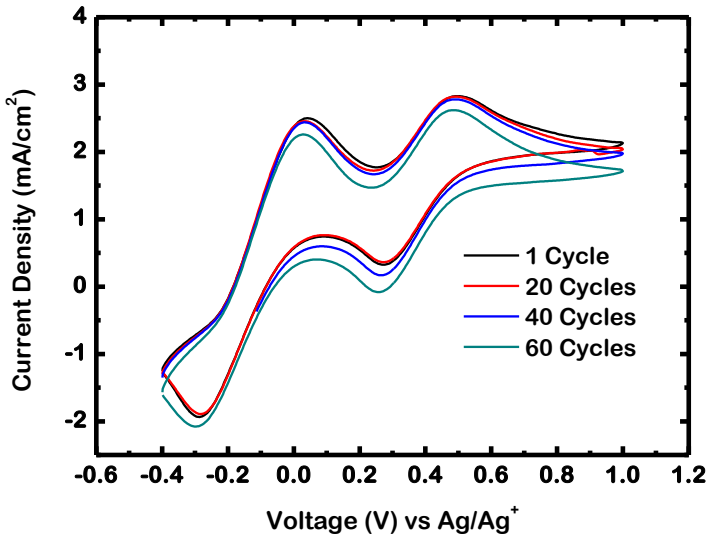

Figure S3. Cyclic voltammograms of 10 min patterned PEDOT counter electrodes as a function of cycle number (scan rate of 50 mVs^{-1}).

Ωcm^2

	Rs	Rct @ CE	Rct @ WE	Diff @ EL
Pt-FTO	1.7	1.0	2.3	1.3
non-patterned	4.0	4.4	3.8	2.2
10 min patterned	2.8	4.3	3.8	2.0
15 min patterned	3.4	4.4	3.8	1.9
20 min patterned	4.4	4.8	3.7	1.9

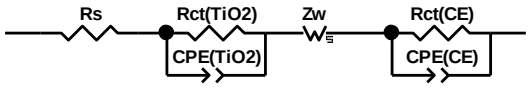

Table S1. R_{ct1}, R_{ct2} and R_{diff} values calculated from the EIS data

Measurements

The electrical conductivity of (poly (3, 4-ethylenedioxythiophene)) (PEDOT) was measured using a standard four-point-probe system with a current source and nanovotmeter. Film thickness was measured using a Alpha-step. The electrical conductivity was calculated by below equation.

$$\rho(ohm \times cm) = 2\pi sF \times t(cm) \times \left(\frac{V}{I}\right)(ohm) = 4.532 \times t \times \left(\frac{V}{I}\right)$$

$$\rho = 4.532 \times 100 \times 10^{-7}(cm) \times \left(\frac{2.5mV}{0.1mA}\right) = 0.001133(ohm \times cm)$$

$$S({}^{1}/_{ohm \times cm}) = {}^{1}/_{\rho} = 882.61({}^{S}/_{cm})$$

Where ρ is resistivity, s is the gap between the probes, F is correction factor, V is the voltage between 2 and 3 probes, I is the applied current between 1 and 4 probes, t is the thickness of PEDOT film, and S is electrical conductivity.