Supporting Information

Morphological Control of Platinum Nanostructures for Highly Efficient Dye-sensitized Solar Cells

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Figure S1. Current-voltage characteristics of DSSC devices with platinum counter electrodes prepared by TD method with the same thermal decomposition process repeated by 1 (red curve), 2 (blue curve) and 4 (black) times.

- 1 time, $FF=0.697$, $\eta=8.35\%$
- 2 times, $FF=0.715$, $\eta=9.03\%$
- 4 times, $FF=0.715$, $\eta=8.93\%$
Figure S2. Cyclic voltammograms for the electro-deposition of Pt via CV scans in aqueous solution containing H$_2$PtCl$_6$ (5 mM) and NaNO$_3$ (5 mM) at scan rate 0.05 V s$^{-1}$. The arrows indicate the order of the deposition cycles.
Figure S3. FESEM top-view image of deposited Pt films obtained on cyclic electrodeposition from a solution composed of H$_2$PtCl$_6$ (5 mM) and KCl (5 mM) with the potential sweeping in range -1.0 – 0.2 V at scan rate 0.05 V s$^{-1}$. 
Figure S4. Current-voltage characteristics of DSSC devices with platinum counter electrodes prepared by TD method (black) and CED method (red); the CED counter electrode was prepared at $[\text{H}_2\text{PtCl}_6] = 5.0$ mM with scan cycles of 4 showing the nanocluster morphology.
**Figure S5.** FESEM top-view images of platinized electrodes fabricated with methods (a) TD and (b) SD.
**Figure S6.** Reflection spectra of Pt films fabricated with CED (blue curve) and SD under different sputtering deposition periods, 5 min (green curve), 5.5 min (red curve) and 6 min (black curve).