Supplementary Material

Energy Harvesting under Dim-Light condition with Dye-sensitized and Perovskite Solar Cells

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Table S1. The comparison of photovoltaic parameters for DSCs with and without blocking under layer (UL) measured under 200 lux illumination. Electrolyte contains 0.1 M $LiClO_4$, 0.2 M TBP, 0.33 M Co^{2+} and 0.05 M Co^{3+} complex in MPN.

Sample	V_{OC} (mV)	J_{SC} ($\mu A/cm^2$)	FF	PCE (%)
Without UL	324	15.6	0.40	3.1
With UL	576	17.3	0.74	11.3

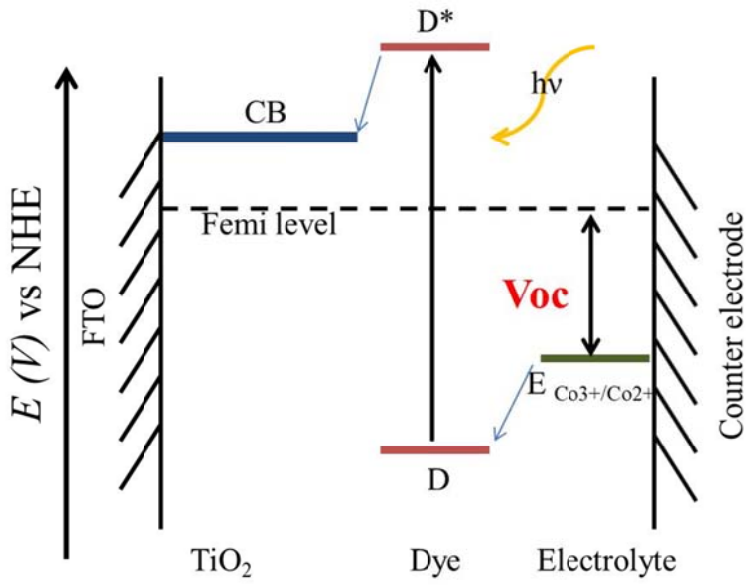

Figure S1. Working principles of a DSC. The open-circuit voltage of the cell is denoted V_{OC}.

Table S2. Photovoltaic parameters of cobalt-based DSCs made by different Co^{2+} concentrations under 200 lux illumination.

Sample	V_{OC} (mV)	J_{SC} ($\mu A/cm^2$)	FF	PCE (%)
0.05 M Co^{2+}	617	21.2	0.76	15.2
0.15 M Co^{2+}	602	22.1	0.78	15.8
0.25 M Co^{2+}	585	21.0	0.76	14.3

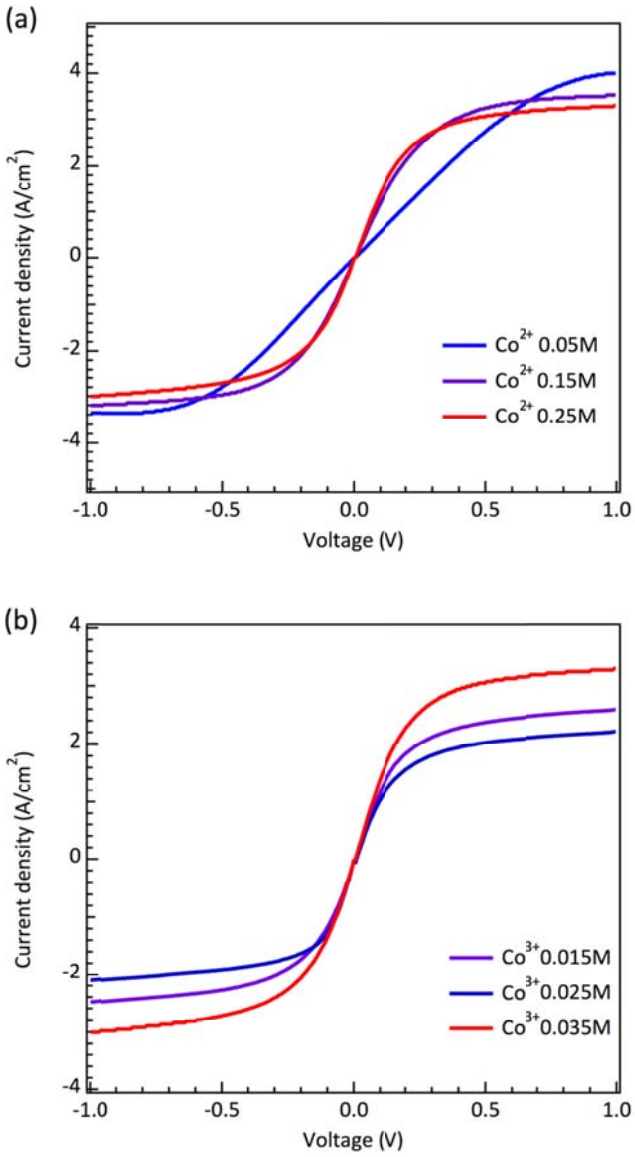

Figure S2. The cyclic voltammetry of dummy cells using different (a) Co^{2+} and (b) Co^{3+} concentration. The dummy cells were fabricated by two symmetry platinized electrodes, the area of surlyn is 0.36 cm^2.

Table S3. Photovoltaic parameters of cobalt-based DSCs made by different Co^{3+} concentrations under 200 lux illumination.

Sample	V_{OC} (mV)	J_{SC} (μA/cm^2)	FF	PCE (%)

0.015 M Co^{3+}	614	24.1	0.72	15.3
0.025 M Co^{3+}	592	23.6	0.75	15.8
0.035 M Co^{3+}	585	21.0	0.76	14.3

Table S4. Photovoltaic parameters of cobalt-based DSCs made by different Li^+ and TBP concentrations under 200 lux illumination.

Sample	V_{OC} (mV)	J_{SC} ($\mu A/cm^2$)	FF	PCE (%)
Lithium-ion free TBP 0.5 M	588	20.0	0.61	10.5
LI^+ 0.1 M TBP 0.5 M	585	21.0	0.76	14.3
LI^+ 0.1 M TBP 0.8 M	591	20.6	0.76	14.2
LI^+ 0.1 M TBP 1.0 M	615	19.5	0.77	14.2

Figure S3. Equivalent circuit model employed for fitting the EIS spectra of cells.