Electronic Supplementary Information (ESI) †

Facile interfacial charge transfer across hole doped cobalt-based MOFs/TiO_2 nano-hybrids leading to MOFs as light harvesting active layer in solar cell

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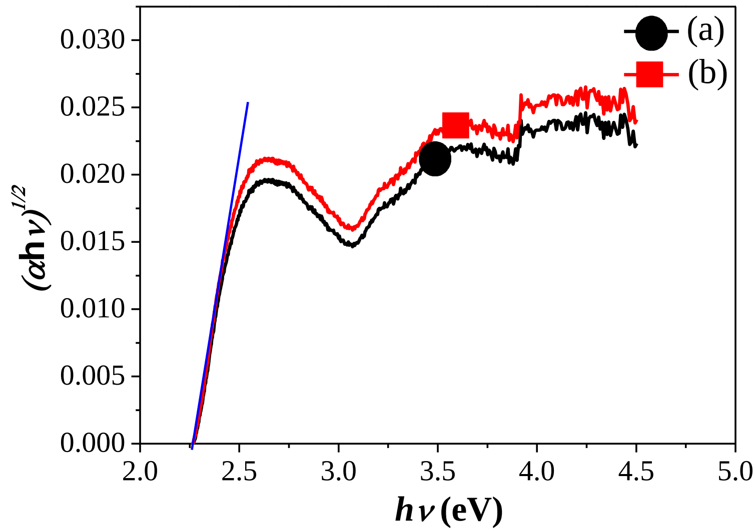

Figure S1. Band gap estimation of iodine treated Co-based MOF films. (a) *Co-BDC* film, and (b) *Co-NDC* film.

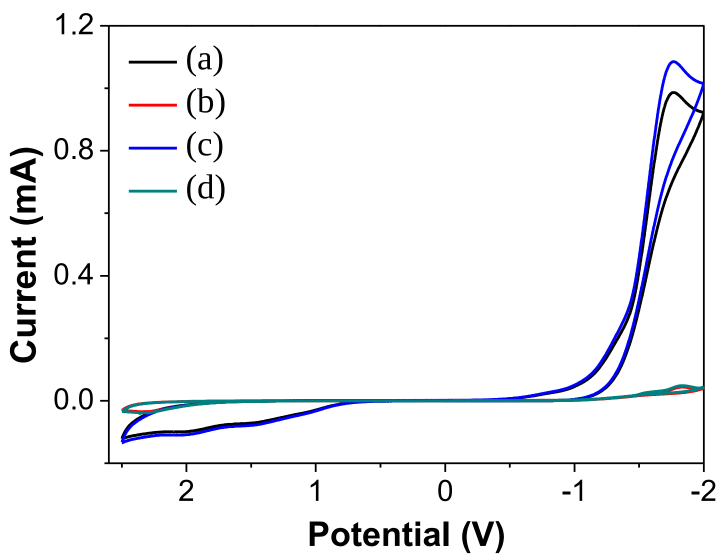

Figure S2. Cyclic voltammograms of MOF LbL films on a FTO glass substrate under N_2 atmosphere. (a) iodine treated *Co-BDC* film, (b) pristine *Co-BDC* film, (c) iodine treated *Co-NDC*, and (d) pristine *Co-NDC*. W.E: MOF film on FTO, C.E: Pt wire, and R.E.: Ag/AgCl; Electrolyte: 0.1 M tetra-n-butylammonium tetrafluoroborate in acetonitrile.

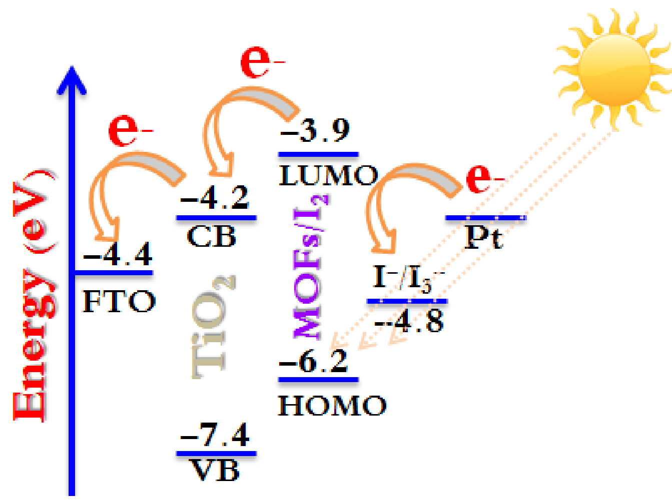

Figure S3. Light harvesting and charge injection mechanism of a device consisting of FTO/TiO_2/I_2 treated Co- MOFs photoanode.

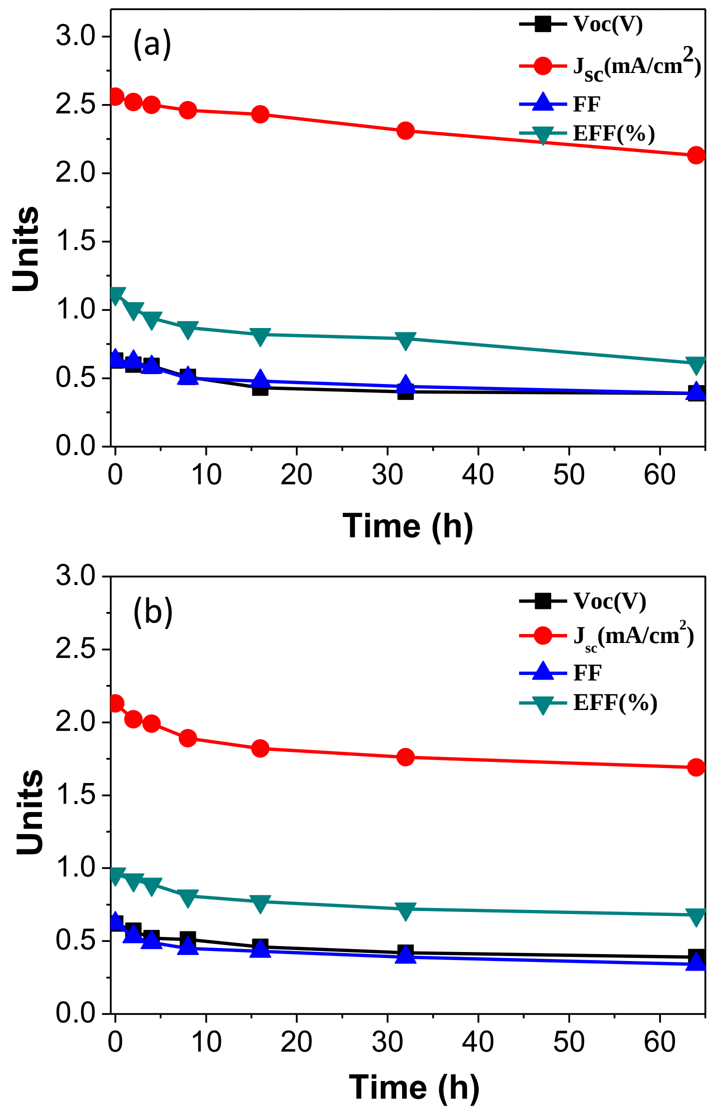

Figure S4. Device stability of solar cell with a photo-anode consisting of I_2 treated Co-MOF/TiO_2/FTO in terms of photovoltaic performance at different intervals. (a) *Co-NDC*/TiO_2/FTO, (b) *Co-BDC*/TiO_2/FTO.

Table S1. Parameters obtained by fitting the impedance spectra using Z-View software. (a) iodine treated *Co-NDC*/TiO_2/FTO, (b) iodine treated *Co-BDC*/TiO_2/FTO, (c) pristine *Co-NDC*/TiO_2/FTO, and (d) pristine *Co-BDC*/TiO_2/FTO.

Sample	**Rs (Ω)**	**R1 (Ω)**	**R2 (Ω)**
(a)	7.66	2.38	32.28
(b)	7.57	2.36	36.23
(c)	7.58	2.29	154.81
(d)	7.66	2.12	218.27