Supporting Information

Layer-by-layer deposition and photovoltaic property of Ru-based metal-organic frameworks

Deok Yeon Lee[1], Eun-Kyung Kim[1], Chan Yong Shin[1], Dipak V. Shinde[1], Wonjoo Lee[2], Nabeen K. Shrestha[1*], Joong Kee Lee[3], Sung-Hwan Han[1*]

[1]Department of Chemistry, Hanyang University, Seoul 133-791Republic of Korea.

[2]Department of Defense Ammunitions, Daeduk College, Daejeon 305-715 Republic of Korea.

[3]Korea Institute of Science and Technology, Seoul 136-791 Republic of Korea.

Table. S1. Photovoltaic performance parameters of solar cell with a photoanode sensitized with Ru-MOF (LbL) film at various LbL cycles.

Photoanode	V_{oc} (V)	J_{sc} (mA/cm^2)	FF	E_{FF} (%)
FTO/TiO_2 /Ru MOFs-10 cycles (undoped I_2)	0.48	0.33	0.39	0.06
FTO/TiO_2/Ru MOFs-2 cycles (doped I_2)	0.56	0.84	0.57	0.27
FTO/TiO_2/Ru MOFs-4 cycles (doped I_2)	0.59	1.19	0.60	0.43
FTO/TiO_2/Ru MOFs-6 cycles (doped I_2)	0.61	1.43	0.61	0.53
FTO/TiO_2/Ru MOFs-8 cycles (doped I_2)	0.62	2.13	0.62	0.83
FTO/TiO_2/Ru MOFs-10 cycles (doped I_2)	0.63	2.56	0.63	1.22
FTO/TiO_2/Ru MOFs-12 cycles (doped I_2)	0.63	2.49	0.63	0.99
FTO/TiO_2/Ru MOFs-14 cycles (doped I_2)	0.61	1.45	0.63	0.58

Table S2. Interfacial resistance obtained by fitting the impedance spectra using Z-view software.

*Fax: +82-2-2299-0762, Tel: +82-2-2220-0934, Email address: shhan@hanyang.ac.kr (S.-H. Han); nabeenkshrestha@hotmail.com (N.K. Shrestha)

Photoanode	Rs (Ω cm^2)	R1 (Ω cm^2)	R2 (Ω cm^2)
I_2 doped	12.47	1.32	129.26
undoped	12.51	1.67	364.08

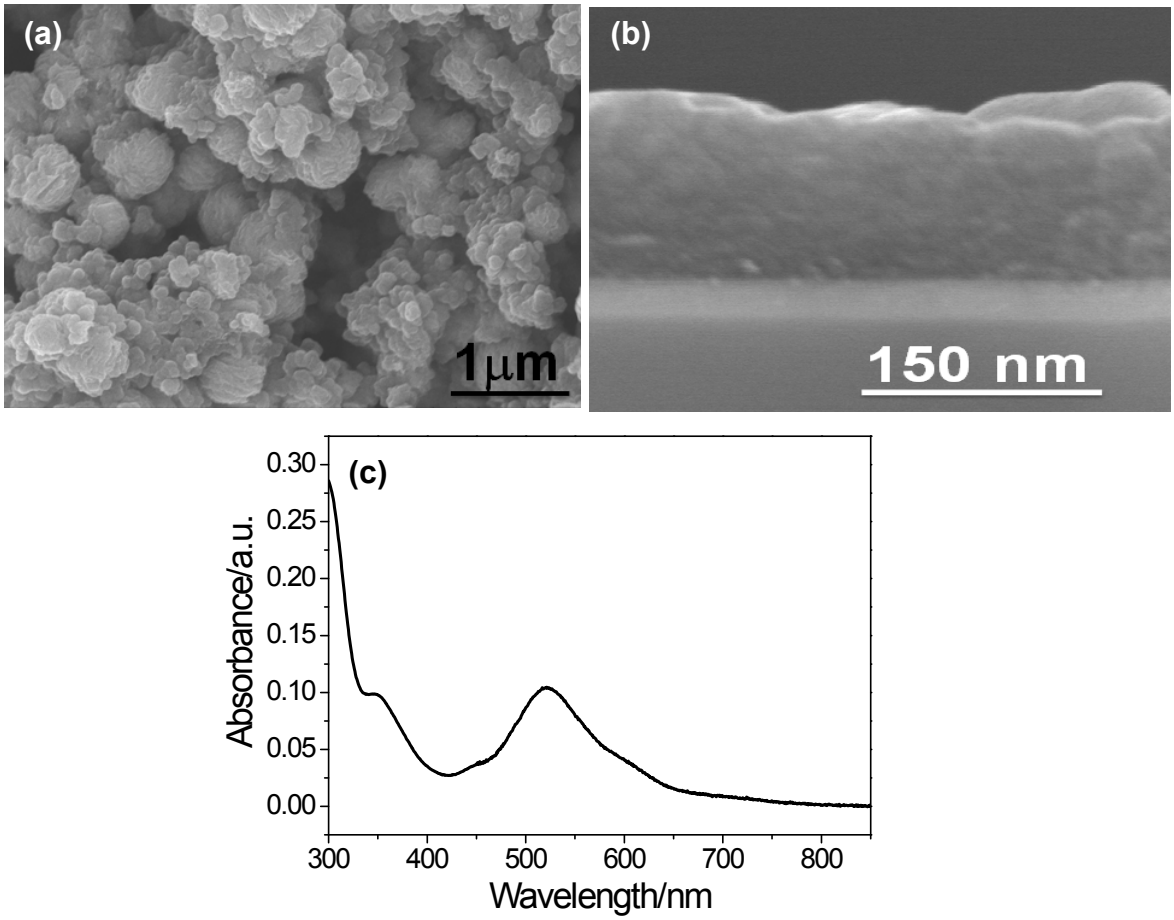

Fig. S1 SEM top (a) and cross sectional (b) views of a thin film of Ru-MOFs prepared by LbL technique (10 LbL cycles) on a glass substrate. (c) UV/Visible absorption spectrum of the same film.

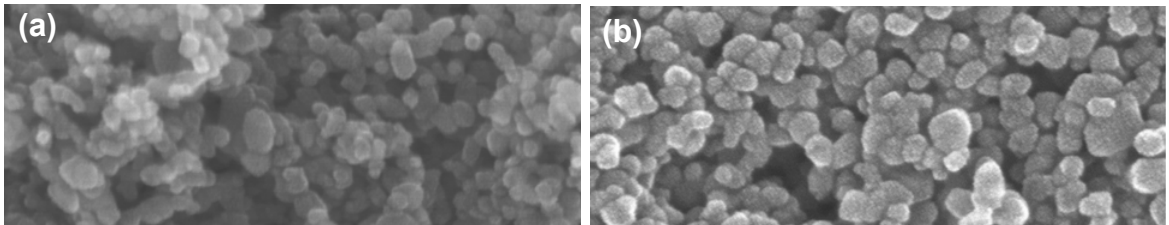

Fig. S2 SEM top views of doctor blade TiO_2 film on a FTO glass (a) before and (b) after, sensitizing with LbL film of Ru-MOFs at 10 LbL cycles.

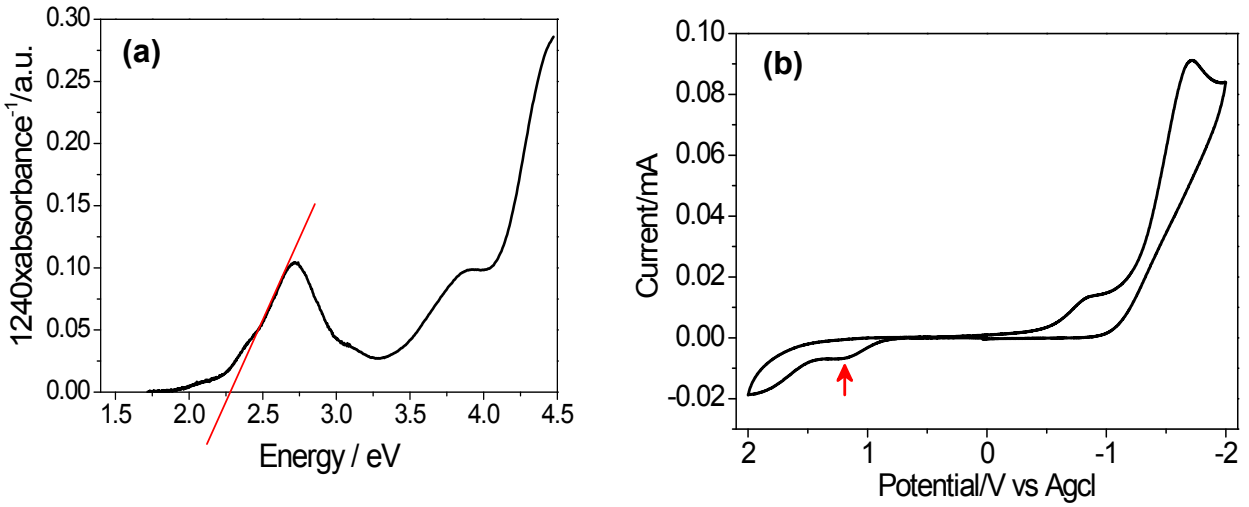

Fig. S3(a) Plot showing the estimation of HOMO-LUMO energy gap of Ru-MOFs film, (b) CV of Ru-MOFs film in acetonitrile containing 0.1 M tetra-n-butlammonium tetra fluoroborate. The arrow in CV indicates the HOMO level.

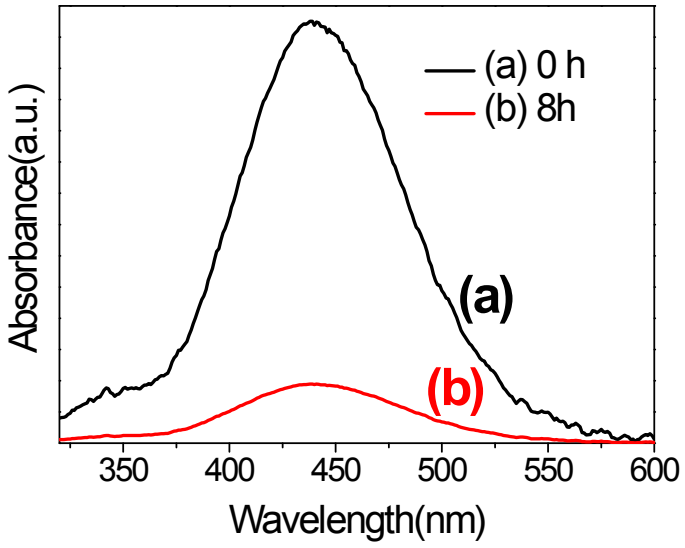

Fig. S4 UV/visible spectra of iodine solution in acetonitrile (a) before and (b) after, immersing thin LbL film of Ru-MOFs on a glass substrate for 8h.