Electronic Supplementary Material (ESI) for Dalton Transactions.
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Supporting Information

Charge recombination control for high efficiency CdS/CdSe quantum dot co-sensitized solar cells with multi-ZnS-layer

Qiang Wu[1,2], Juan Hou[1,2*], Haifeng Zhao[1,2], Zhiyong Liu [1], Xuanyu Yue[1,2], Shanglong Peng[3], Haibin Cao[2*]

[1]College of Science/Key Laboratory of Ecophysics and Department of Physics, [2]School of Chemistry and Chemical Engineering / Key Laboratory for Green Process of Chemical Engineering of Xinjiang Bingtuan, Shihezi University, Xinjiang Shihezi 832003, P. R. China

[3] School of Physical Science and Technology/ Key Laboratory for Magnetism and Magnetic Materials of the Ministry of Education, Lanzhou University, Lanzhou, 730000, China.

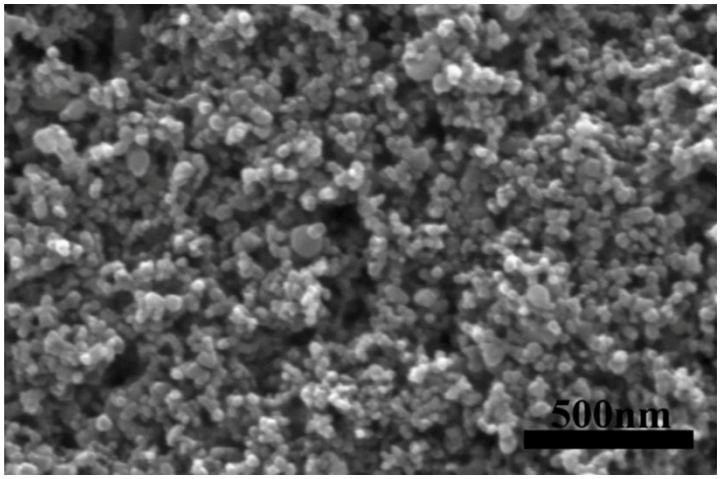

Figure S1. SEM images of top view of TiO_2 film.

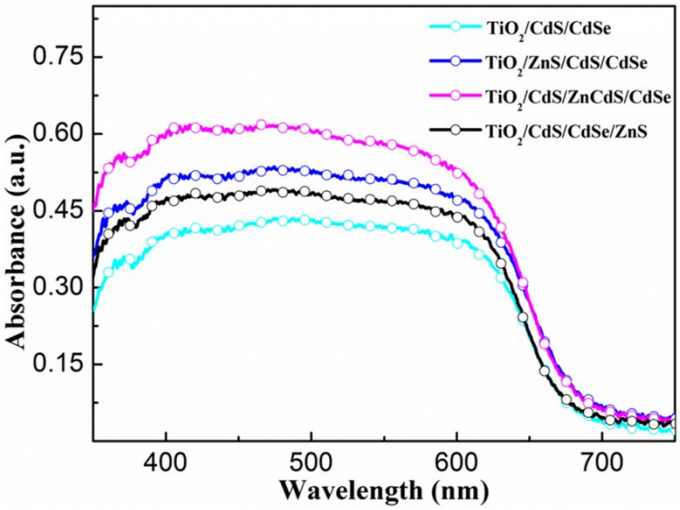

Figure S2. UV-vis absorption spectra of ZnS layer at different sites based on the CdS/CdSe QDs sensitized photoanodes.

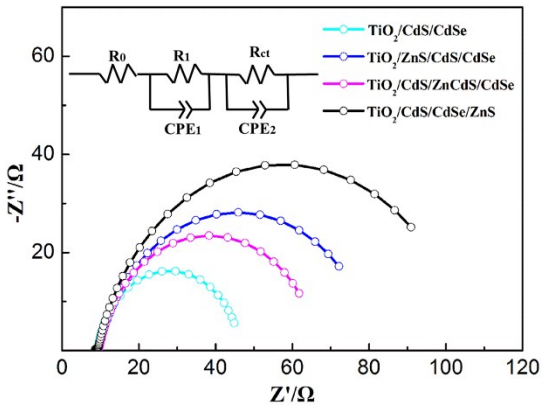

Figure S3. EIS of ZnS layer at different sites based on the CdS/CdSe QDs sensitized photoanodes.

Table S1. The fitting results of the EIS of QDSCs

Sample	$R_0(\Omega)$	$R_{ct}(\Omega)$	CPE_2 (mF)	τ_n(ms)
TiO_2/CdS/CdSe	8.5	37.1	1.3	48.2
TiO_2/ZnS/CdS/CdSe	8.5	72.3	1.3	94.0
TiO_2/CdS/ZnCdS/CdSe	8.4	57.3	1.3	74.5
TiO_2/CdS/CdSe/ZnS	8.2	96.6	1.4	135.2

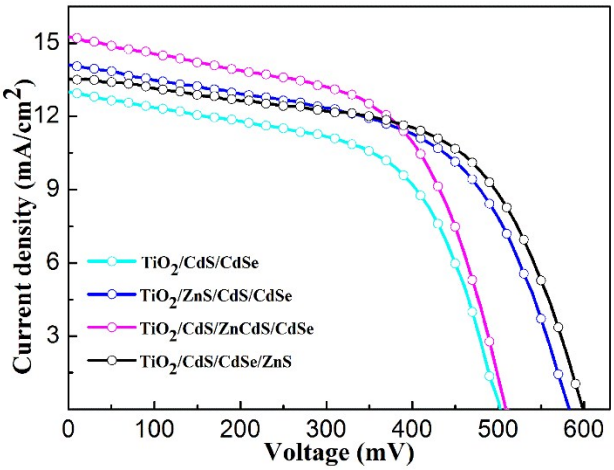

Figure S4. *J-V* curves of QDSCs based on CdS/CdSe co-sensitized for the different configuration structures.

Table S2 Photovoltaic properties obtained from the *J-V* curves

Sample	V_{oc}（mV）	J_{sc}（mA/cm^2）	FF	PCE（%）
TiO_2/CdS/CdSe	502	13.0	0.58	3.77
TiO_2/ZnS/CdS/CdSe	583	14.1	0.56	4.60
TiO_2/CdS/ZnCdS/CdSe	509	15.3	0.58	4.47
TiO_2/CdS/CdSe/ZnS	599	13.5	0.59	4.80

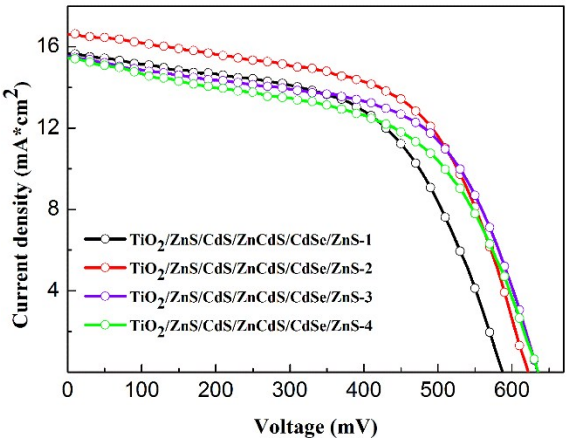

Figure S5. *J-V* curves of QDSCs based on TiO_2/ZnS/CdS/ZnCdS/CdSe/ZnS of the ZnS passivation layer deposition number of the inner, the middle and the outer

Table S3 Photovoltaic properties obtained from the *J-V* curves

Sample	V_{oc}（mV）	J_{sc}（mA/cm^2）	FF	PCE（%）
TiO_2/ZnS/CdS/ZnCdS/CdSe/ZnS-1	587	15.6	0.56	5.18
TiO_2/ZnS/CdS/ZnCdS/CdSe/ZnS-2	622	16.6	0.59	6.05
TiO_2/ZnS/CdS/ZnCdS/CdSe/ZnS-3	635	15.5	0.59	5.78
TiO_2/ZnS/CdS/ZnCdS/CdSe/ZnS-4	635	15.4	0.54	5.33