Electronic Supplementary Information (ESI)

CdTe based quantum dot sensitized solar cells with efficiency exceeding 7% directly from quantum dots prepared in aqueous media

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Table S1 Detail parameters for 5 QDSCs in parallel corresponding to differently sized CdTe QD sensitizers

QDs	J_{sc} (mA·cm^{-2})	V_{oc} (V)	FF (%)	PCE (%)	PCE (%)[a]
QD_{554}	0.627	9.63	0.678	4.09	4.04 ± 0.09
	0.622	9.48	0.673	3.97	
	0.632	9.58	0.683	4.14	
	0.626	9.40	0.668	3.93	
	0.628	9.78	0.665	4.08	
QD_{608}	0.608	11.85	0.667	4.81	4.87 ± 0.07
	0.615	11.53	0.676	4.79	
	0.601	11.97	0.683	4.91	
	0.612	12.05	0.665	4.90	
	0.610	11.77	0.687	4.93	
QD_{640}	0.587	12.17	0.638	4.56	4.54 ± 0.08
	0.584	12.30	0.645	4.63	
	0.593	12.01	0.623	4.44	
	0.582	12.35	0.639	4.59	
	0.598	11.92	0.630	4.49	

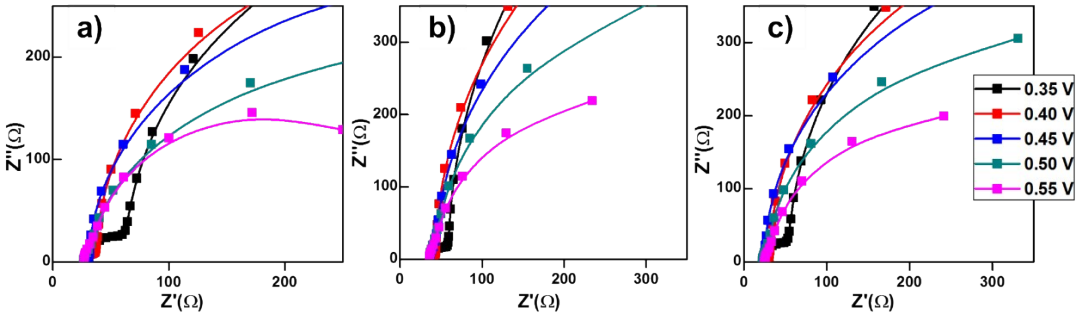

Fig. S1 Nyquist curves under different bias voltages for CdTe (a), CdTe/CdS (b) and CdTe/CdSeS (c) QDSC devices.

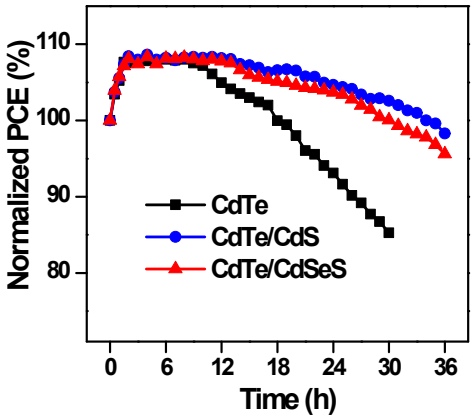

Fig. S2 Cell efficiency normalized to the initial efficiency for CdTe, CdTe/CdS and CdTe/CdSeS cells under continuous 1 sun illumination.

Table S2 Photovoltaic parameters for 5 QDSCs in parallel corresponding to 4 cycles of CdS SILAR and 2-8 cycles of CdSeS SILAR

QDs	J_{sc} (mA·cm^{-2})	V_{oc} (V)	FF (%)	PCE (%)	PCE (%)[a]
Plain CdTe	0.608	11.85	0.667	4.81	4.87 ± 0.07
	0.615	11.53	0.676	4.79	
	0.601	11.97	0.683	4.91	
	0.612	12.05	0.665	4.90	
	0.610	11.77	0.687	4.93	
CdTe/4CdS	0.645	13.93	0.683	6.14	5.95 ± 0.17
	0.631	14.01	0.668	5.91	
	0.640	13.55	0.659	5.71	
	0.653	13.77	0.678	6.10	
	0.639	14.12	0.657	5.93	
CdTe/2CdSeS	0.629	12.89	0.680	5.51	5.51 ± 0.07
	0.633	13.03	0.676	5.58	
	0.622	13.25	0.672	5.54	
	0.616	12.77	0.686	5.40	
	0.641	12.69	0.679	5.52	
CdTe/4CdSeS	0.628	15.43	0.687	6.66	6.60 ± 0.10
	0.632	15.18	0.676	6.49	
	0.618	15.62	0.695	6.71	
	0.637	15.48	0.673	6.64	
	0.615	15.16	0.697	6.50	
CdTe/5CdSeS	0.636	16.37	0.687	7.15	7.10 ± 0.15
	0.629	16.58	0.694	7.24	
	0.621	16.20	0.691	6.95	
	0.638	16.15	0.697	7.18	
	0.609	16.71	0.679	6.91	
CdTe/6CdSeS	0.609	16.09	0.657	6.44	6.47 ± 0.10
	0.613	16.29	0.643	6.42	
	0.622	16.35	0.641	6.52	
	0.606	16.27	0.671	6.62	
	0.607	15.82	0.662	6.36	
CdTe/8CdSeS	0.585	14.85	0.620	5.39	5.39 ± 0.16
	0.579	14.76	0.618	5.28	
	0.571	15.12	0.630	5.44	
	0.592	14.99	0.636	5.64	
	0.586	14.58	0.611	5.22	