Electronic Supplementary Information

Preparation of $AgInS_2$ quantum dots/In_2S_3 co-sensitized photoelectrodes by a facile aqueous-phase synthesis route and their photovoltaic performance

Yuan-qiang Wang[a, c], Qing-hong Zhang[b], Yao-gang Li[b*], Hong-zhi Wang[a*]

[a] *State Key Laboratory for Modification of Chemical Fibers and Polymer Materials, College of Materials Science and Engineering, Donghua University, Shanghai 201620, People's Republic of China. E-mail: wanghz@dhu.edu.cn ; Tel: +86-21-67792881; fax: +86-21-67792855*

[b] *Engineering Research Center of Advanced Glasses Manufacturing Technology, Donghua University, Shanghai 201620, People's Republic of China. E-mail: yaogang_li@dhu.edu.cn*

[c] *College of Chemistry and Chemical Engineering, Shanghai University of Engineering Science, Shanghai 201620, People's Republic of China.*

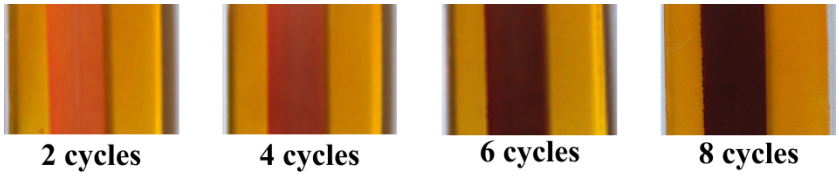

Fig. 1S Photograph images of $TiO_2/AgInS_2$-QDs/In_2S_3 electrodes obtained by CBD of In_2S_3 and *in situ* reaction with different cycle of Ag_2S SILAR deposition on TiO_2 films.

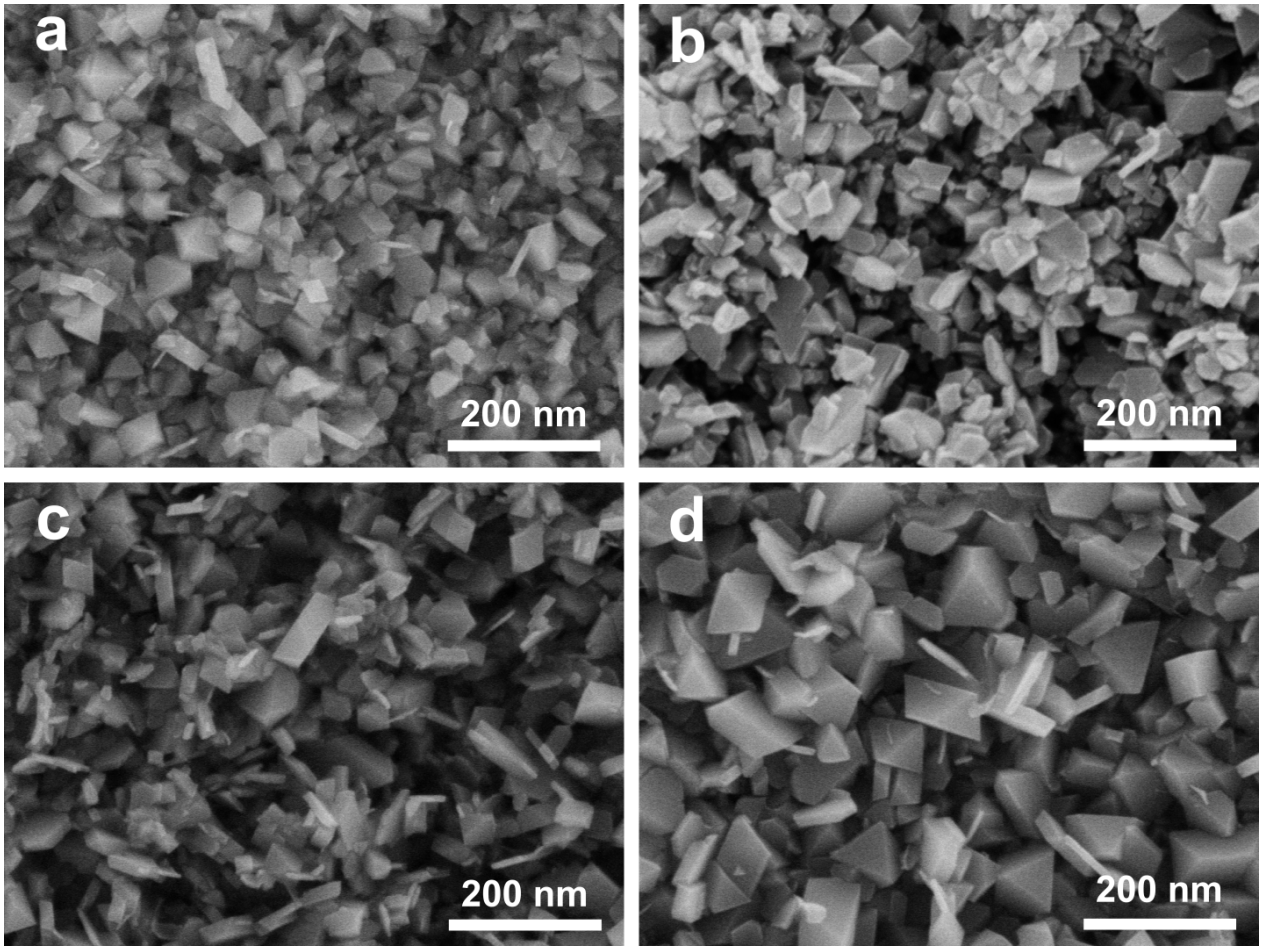

Fig. 2S FESEM images of $TiO_2/AgInS_2$-QDs/In_2S_3 photonaodes obtained by CBD of In_2S_3 and *in situ* reaction with different cycle of Ag_2S SILAR deposition on TiO_2 films: (a) 2 cycles. (b) 4 cycles. (c) 6 cycles. (d) 8 cycles.

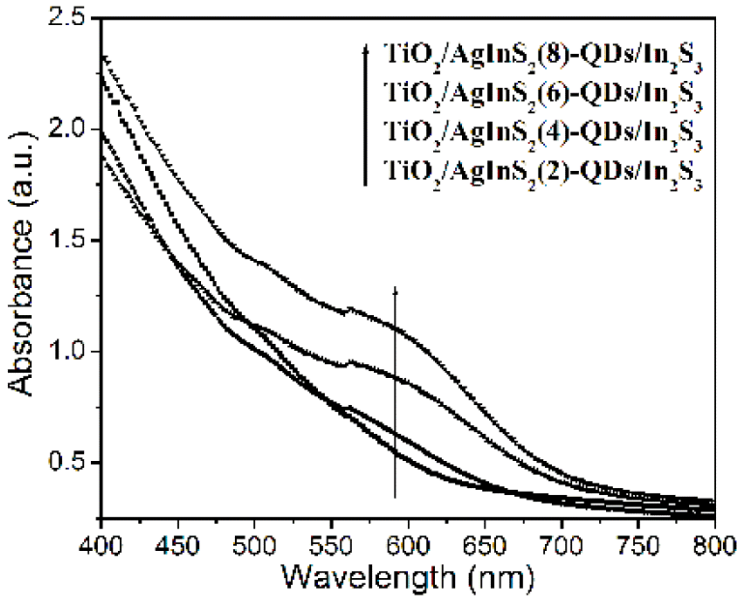

Fig. 3S Optical absorption spectra of $TiO_2/AgInS_2$-QDs/In_2S_3 photonaodes obtained by CBD of In_2S_3 and *in situ* reaction with different cycle of Ag_2S SILAR deposition on TiO_2 films.

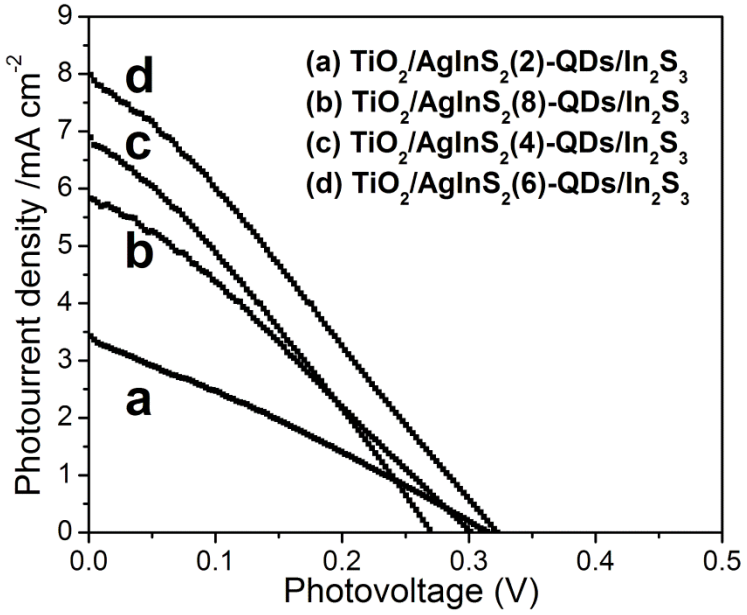

Fig. 4S Photocurrent voltage characteristics of $TiO_2/AgInS_2$-QDs/In_2S_3 photonaodes obtained by CBD of In_2S_3 and *in situ* reaction with different cycle of Ag_2S SILAR deposition on TiO_2 films.

Table 1S Photovoltaic parameters of $TiO_2/AgInS_2$-QDs/In_2S_3 photonaodes obtained by CBD of In_2S_3 and *in situ* reaction with different cycle of Ag_2S SILAR deposition on TiO_2 films.

Photoanode	J_{sc} (mA cm^{-2})	V_{oc} (V)	*FF*	η (%)
$TiO_2/AgInS_2$(2)-QDs/In_2S_3	3.39	0.31	0.28	0.30± 0.02
$TiO_2/AgInS_2$(4)-QDs/In_2S_3	6.82	0.27	0.29	0.54± 0.02
$TiO_2/AgInS_2$(6)-QDs/In_2S_3	7.87	0.32	0.28	0.70± 0.02
$TiO_2/AgInS_2$(8)-QDs/In_2S_3	5.82	0.30	0.28	0.50± 0.02