

Supporting Information for :

Nanoporous photocathode and photoanode made
by multilayer assembly of quantum dots

*Mohamad Hojeij, Bin Su, Shuxin Tan, Guillaume Mériquet and Hubert H. Girault**

Laboratoire d'Electrochimie Physique et Analytique, Ecole Polytechnique Fédérale de
Lausanne, Station 6, CH-1015 Lausanne, Switzerland

*Corresponding author: Prof. Hubert H. Girault, Tel: +41 21 693 3151, Fax: +41 21 693 3667.

E-mail: hubert.girault@epfl.ch

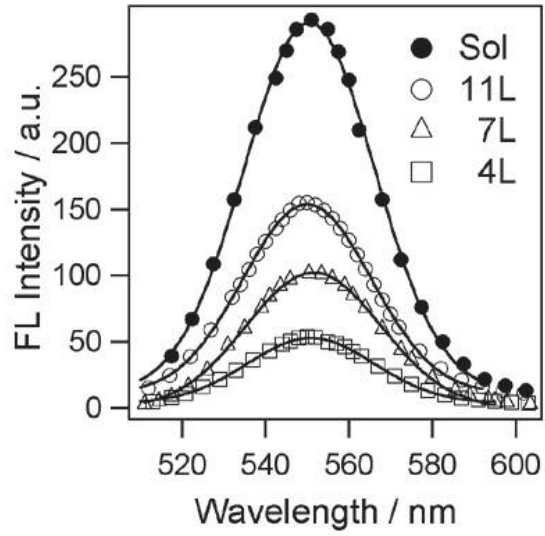


Figure S1. Not normalized Steady-state fluorescence spectra of CdSe films at $n = 4, 7$ and 11 Layers.

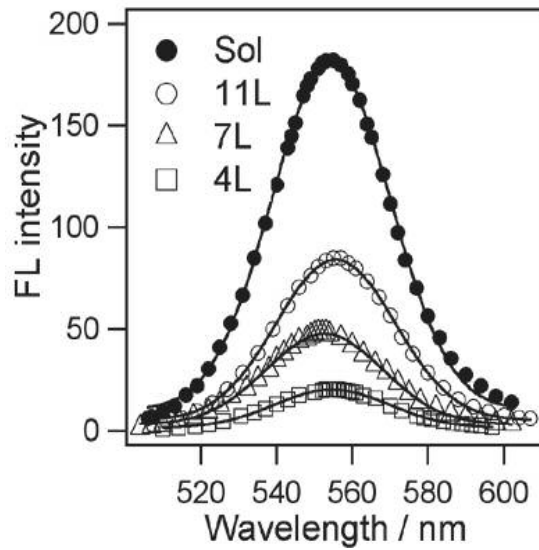


Figure S2. Not normalized Steady-state fluorescence spectra of CdSe@CdS films at $n = 4, 7$ and 11 Layers.

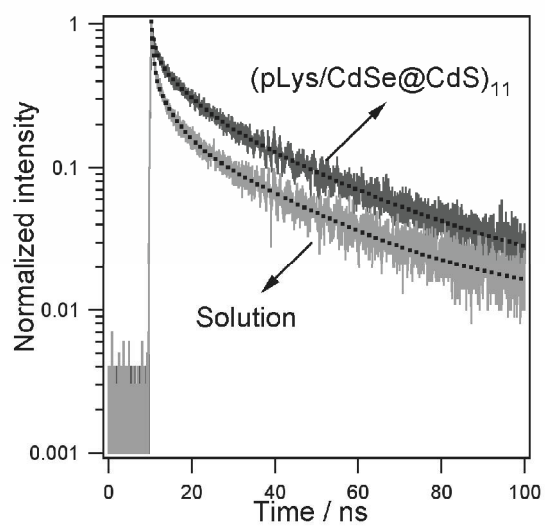


Figure S3. Fluorescence decay profiles of CdSe in solution and in (pLys/CdSe@CdS)₁₁. The dashed lines show the best fit obtained by eq (1).

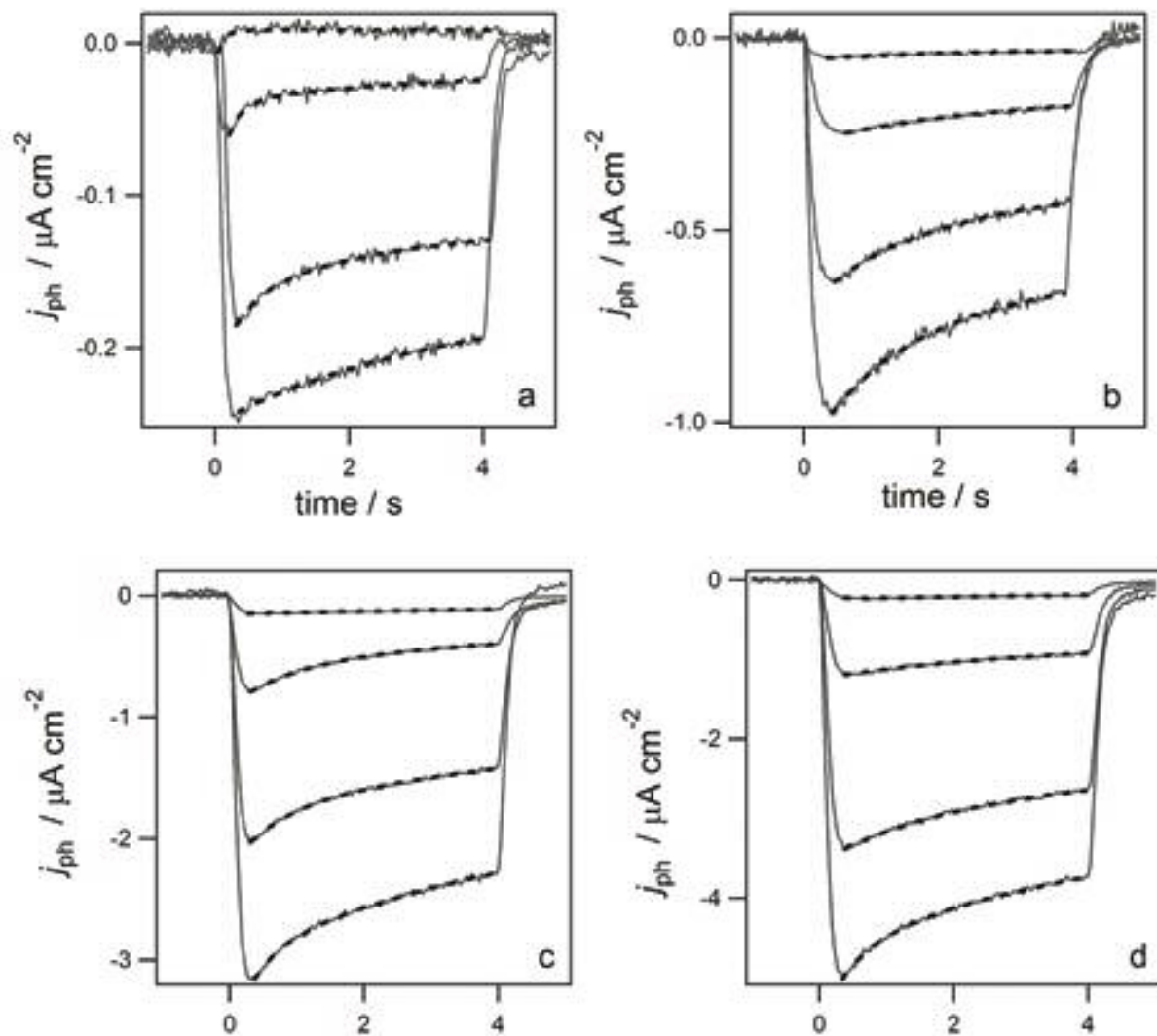


Figure S4. Photocurrent transient responses of (pLys/CdSe)₁ (a), (pLys/CdSe)₃ (b), (pLys/CdSe)₇ (c) and (pLys/CdSe)₁₀ (d) at four different potentials : -0.4 V, 0 V, 0.4 V and 0.8 V from bottom to top. The dashed lines are fittings employing eq. 6.

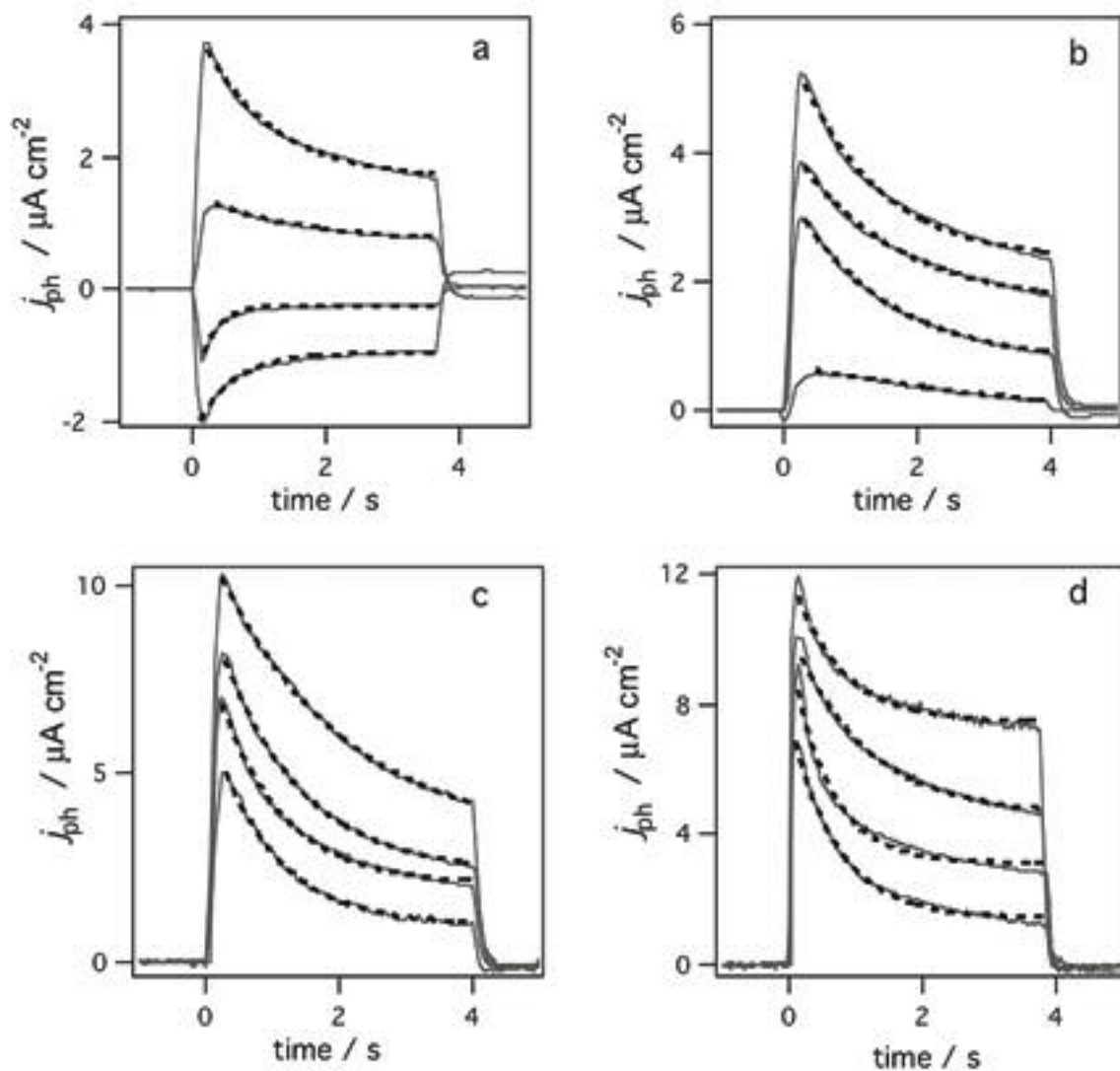


Figure S5. Photocurrent transient responses of (pLys/CdSe@CdS)₁ (a), (pLys/CdSe@CdS)₃ (b), (pLys/CdSe@CdS)₇ (c) and (pLys/CdSe@CdS)₁₀ (d) at four different potentials : -0.4 V, 0 V, 0.4 V and 0.8 V from bottom to top. The dashed lines are fittings employing eq. 6

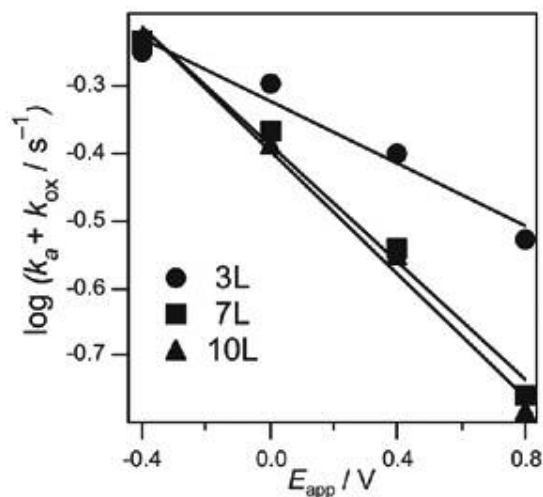


Figure S6. Values of $\log(k_{ox} + k_a)$ vs electrode potential for various film thicknesses, extracted from the fitting results of photocurrent decay in figure S3 using eq. 6.

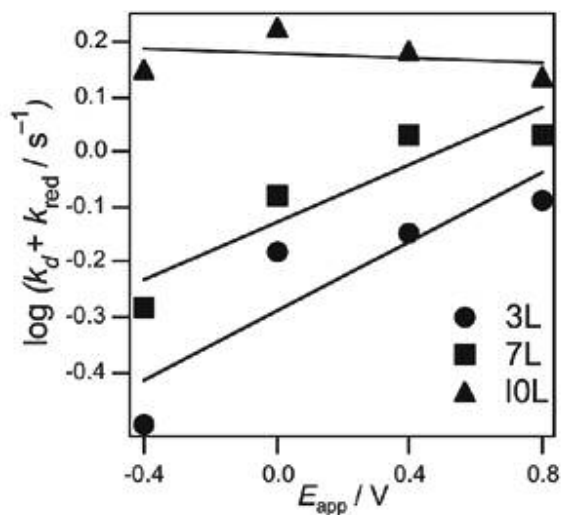


Figure S7. $\log(k_{red} + k_d)$ vs electrode potential for 3, 7 and 10 bilayers of $(pLys/CdSe@CdS)_n$, extracted from the fitting results of photocurrent decay in Figure S4 using eq. 6.

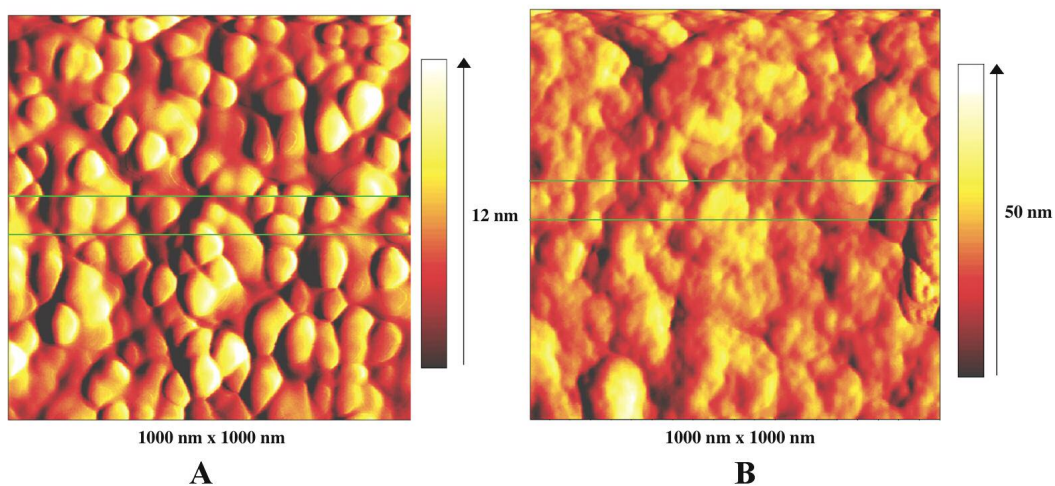


Figure S8. Atomic Force Microscopy (model Quesant Universal SPM), images taken in tapping mode: (A) AFM image of the naked gold substrate, (B) AFM image of the (pLys/CdSe)₄ film deposited on the same gold substrate. The average surface height of the naked substrate and the modified gold is 6.2 nm and 28.2 nm respectively.

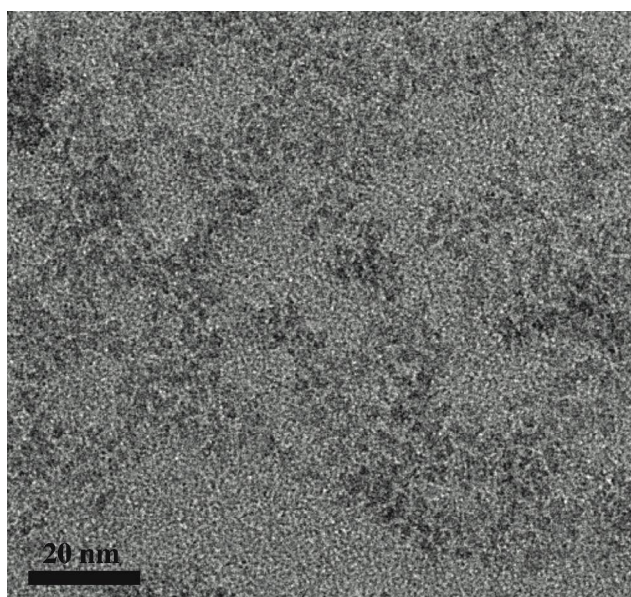


Figure S9. Transmission Electron Microscopy (TEM) image of the CdSe particles.