

## ***Supporting Information***

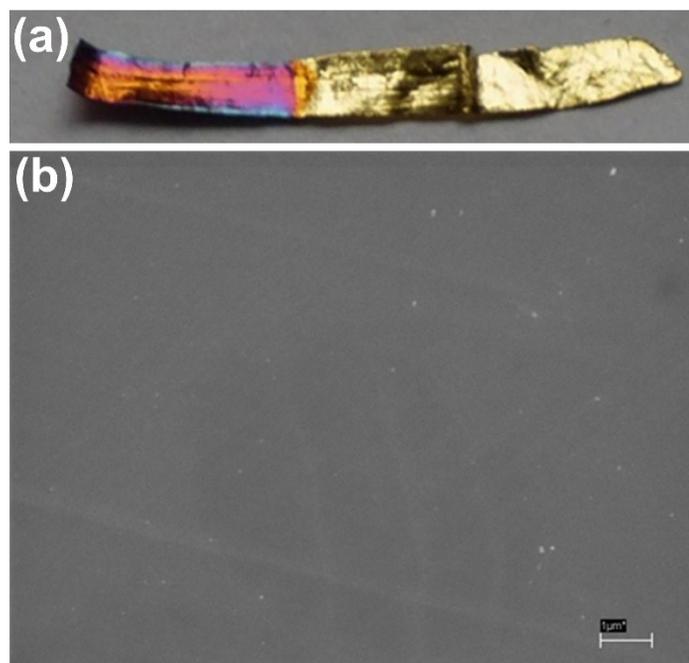
### **Cyclic voltammetry as a sensitive method for in-situ probing of chemical transformations in quantum dots**

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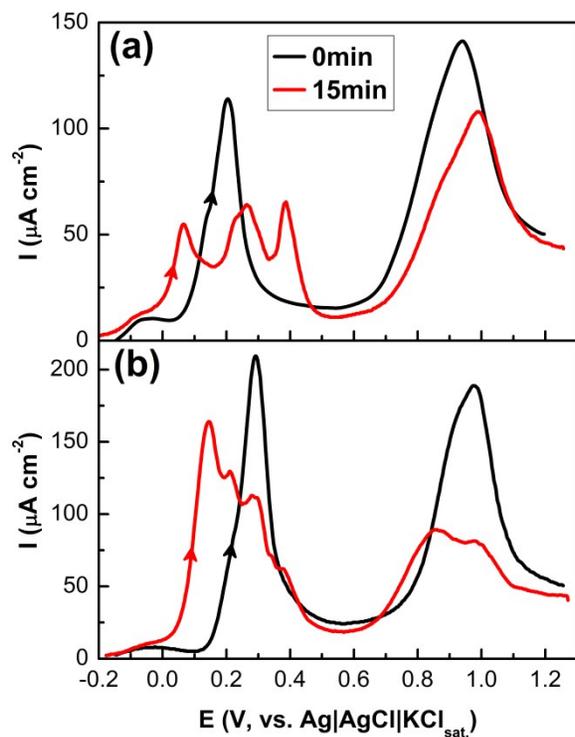
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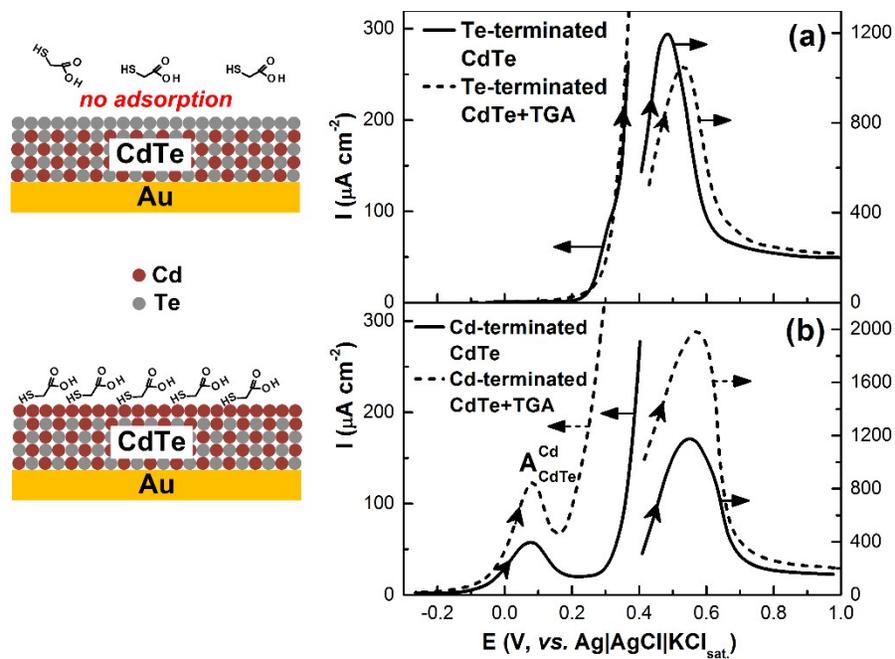
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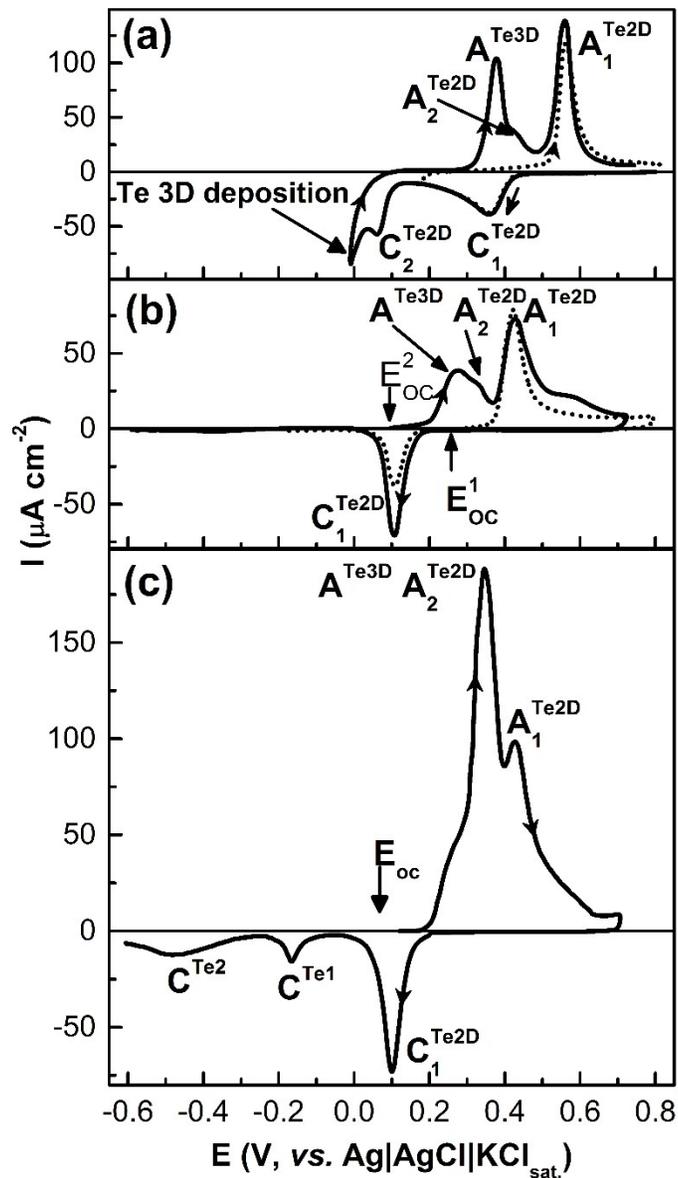
**Figure S11.** A photograph of a gold foil with electrochemically deposited CdTe thin film (a) with its scanning electron microscopy image (b) showing that the film is rather complete than island-like, and does not have micro-defects. Deposited film is coloured due to optical interference effects.



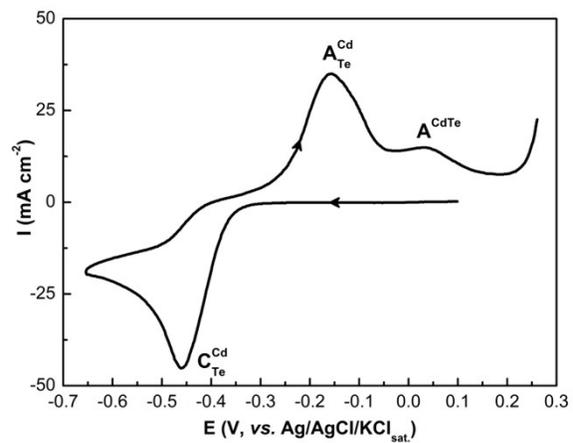
**Figure S12.** Anodic voltammograms of Au electrodes with adsorbed CdTe QDs with sizes of 2 nm (a) and 3.5 nm (b) recorded immediately after immersing (black curves) and after keeping under open circuit conditions for 15 min before polarization (red curves). Electrolyte: acetate buffer (pH 5).



**Figure S13.** Anodic voltammograms of Te-terminated (a) and Cd-terminated (b) CdTe thin film electrodes as-prepared (solid lines) and treated with TGA (dashed lines) with corresponding sketches on the left. Electrolyte: acetate buffer (pH 5).



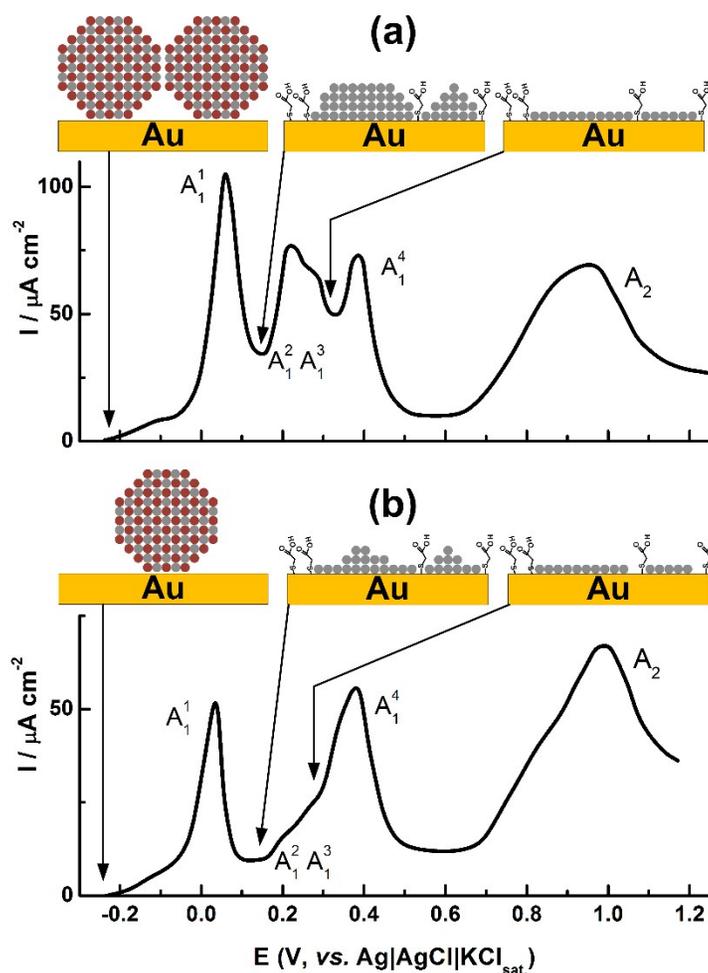
**Figure S14.** Voltammograms of Au electrode in 1 mM  $\text{TeO}_2$  + 0.05M  $\text{H}_2\text{SO}_4$  solution (a) and those of Au electrode with electrodeposited Te in acetate buffer solution (pH 5) (b, c). Polarization of electrodes started from the open circuit potential ( $E_{\text{oc}}$ ). In (b) dotted and solid lines correspond to  $E_{\text{oc}}^1$  and  $E_{\text{oc}}^2$  values, respectively.



**Figure S15.** Voltammogram of Te electrode in acetate buffer (pH 5) containing 0.002M Cd(CH<sub>3</sub>COO)<sub>2</sub>. Potential sweep rate: 20 mV·s<sup>-1</sup>.

### Decomposition of CdTe QDs adsorbed on Au electrode surface after losing cadmium upon anodic polarization

Figure S16 presents anodic voltammograms of 2.8 nm CdTe QDs|Au-electrodes with different amounts of adsorbed particles recorded after 15 min soaking in acetate buffer (pH 5) under open circuit conditions (the amount of QDs in (a) is approx. twice larger than in (b)). The states of the system in the key points of potential scale are also schematically shown. As seen from voltammograms,  $A_1^2$  and  $A_1^3$  peaks are smaller relative to  $A_1^1$  and  $A_1^4$  ones in (b), as compared to (a). Consequently, in the case (b) after Cd dissolution, as a result of anodic polarization, tellurium remains on Au surface predominantly as a monolayer (Te2D), whereas only a small part of tellurium is present as Te3D. With larger amount of adsorbed particles more tellurium is produced on the surface during electrooxidation of QDs. In this case, since there is not enough space for that much tellurium to form a 2D layer on the surface, more Te3D domains are formed. Therefore, after cadmium dissolution CdTe QDs disintegrate and transform into Te particles.



**Figure S16.** Voltammograms of 2.8 nm CdTe QDs|Au-electrodes soaked for 15 min in acetate buffer under open circuit conditions prior to starting the anodic polarization. The amount of QDs adsorbed in (a) is approx. twice larger than in (b). The states of the system in the key points are schematically represented.