

## Supporting Information

### **IR–Spectrophotoelectrochemical Characterization of Mesoporous Semiconductor Films**

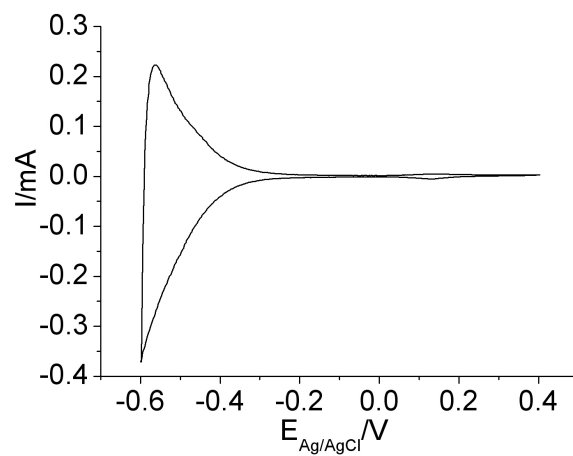
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#### **Experimental details**

IR-spectroscopic measurements were performed at an incident angle of 55° using unpolarized light. The spectra were obtained by averaging 24 scans at a resolution of 4 cm<sup>-1</sup>. The spectra are represented as  $-\log(R/R_0)$ , where R and R<sub>0</sub> are the reflectance values corresponding to the single beam spectra recorded for the sample and the reference, respectively. N<sub>2</sub>-purged 0.1 M HClO<sub>4</sub> aqueous solution, which was prepared using water with a conductivity of 18 MΩ·cm (Millipore, MilliQ), was used as the working electrolyte. All potentials were measured against and are referred to a Ag/AgCl/KCl(3M) electrode (BASi, RE-5B), whereas a Pt wire was used as a counter electrode. Measurements were performed with a computer-controlled Autolab PGSTAT101 potentiostat. A 450 W Xe arc lamp (Oriel) equipped with a water filter and an UG11 filter was used for UV irradiation of the electrode from the top (substrate–electrode illumination). The applied light irradiance (corrected for absorption of the FTO substrate) was measured with an optical power meter (Gentec TUNER) equipped with a bolometer (Gentec XLP12-1S-H2) being 5 mW·cm<sup>-2</sup> in the photon energy range ~3.8 eV (FTO substrate) > E > 3.1 eV (UG11 filter).



**Figure S1:** Cyclic voltammogram of an anatase TiO<sub>2</sub> nanocrystal electrode. Electrolyte: N<sub>2</sub>-saturated 2 M HCOOH/0.1 M HClO<sub>4</sub> aqueous solution; Scan rate: 20 mV·s<sup>-1</sup>