

Supplementary Information File

Photoinduced charge separation in functional carbon-silver nanohybrids

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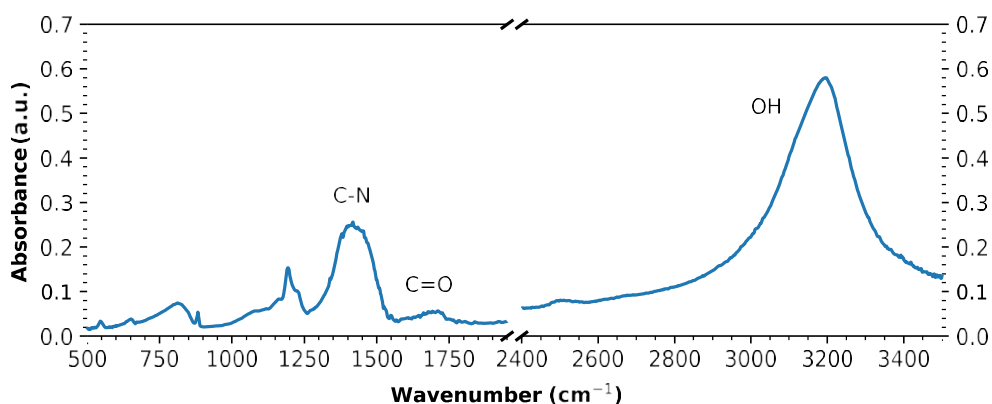


Figure S1 – ATR infrared absorption spectrum of CDs. Vibrations at $\approx 1700\text{ cm}^{-1}$ and 3200 cm^{-1} are attributed to surface carboxylic and hydroxyl groups, respectively, while the broad peak around 1400 cm^{-1} is attributed to core C-N vibrations.

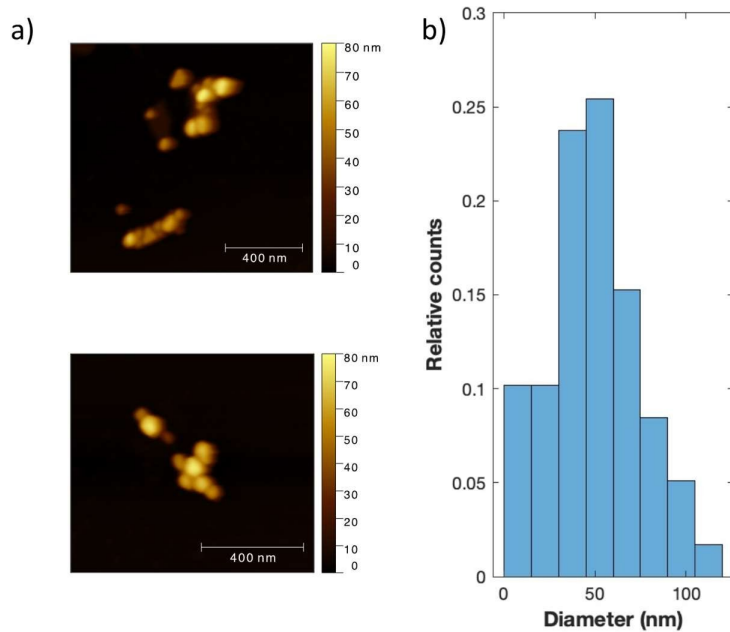


Figure S2 – (a) Representative AFM images of AgNP- sample. (b) AgNP- size distribution extracted from AFM measurements.

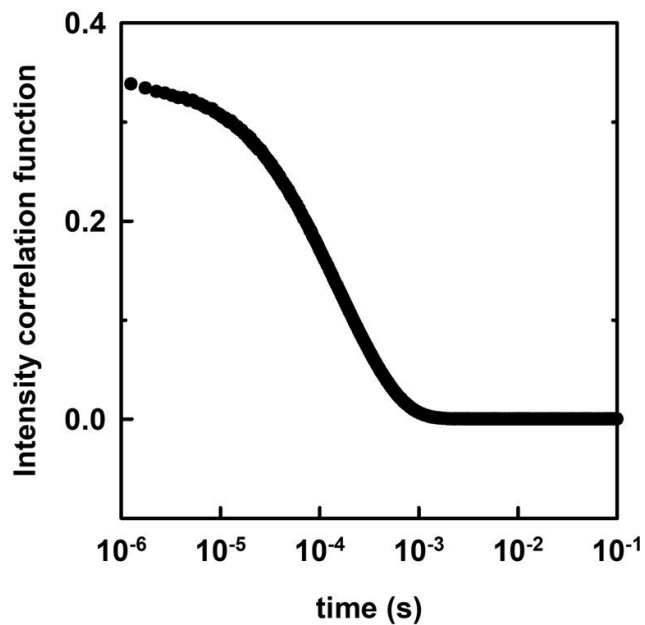


Figure S3 – Intensity correlation function for AgNP- sample obtained by DLS measurements. Data analysis revealed an average hydrodynamic radius of (26 ± 3) nm.

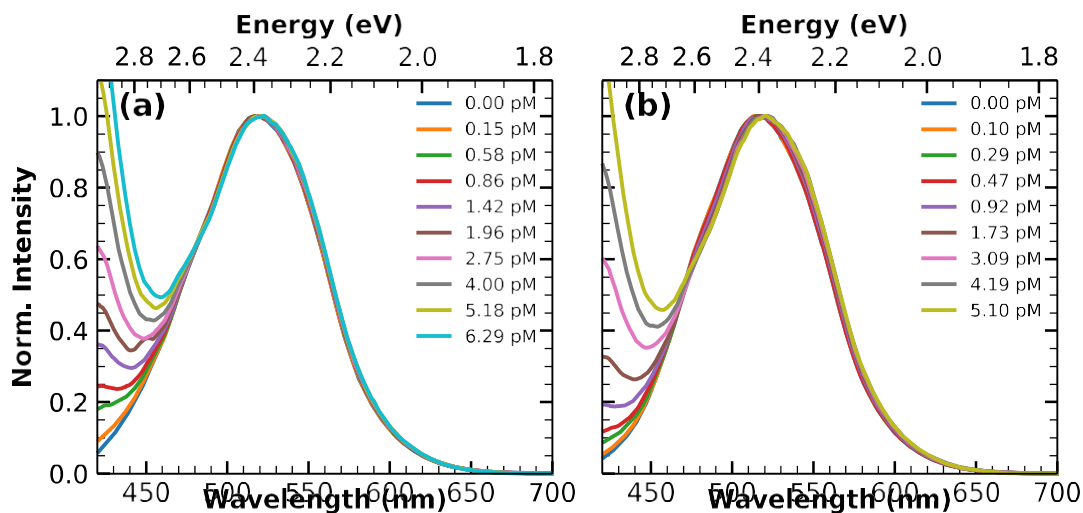


Figure S4 – Normalized photoluminescence spectra under 410 nm excitation of the CD solution in the presence of increasing amount (as indicated in the legends) of (a) AgNP- and (b) AgNP+.

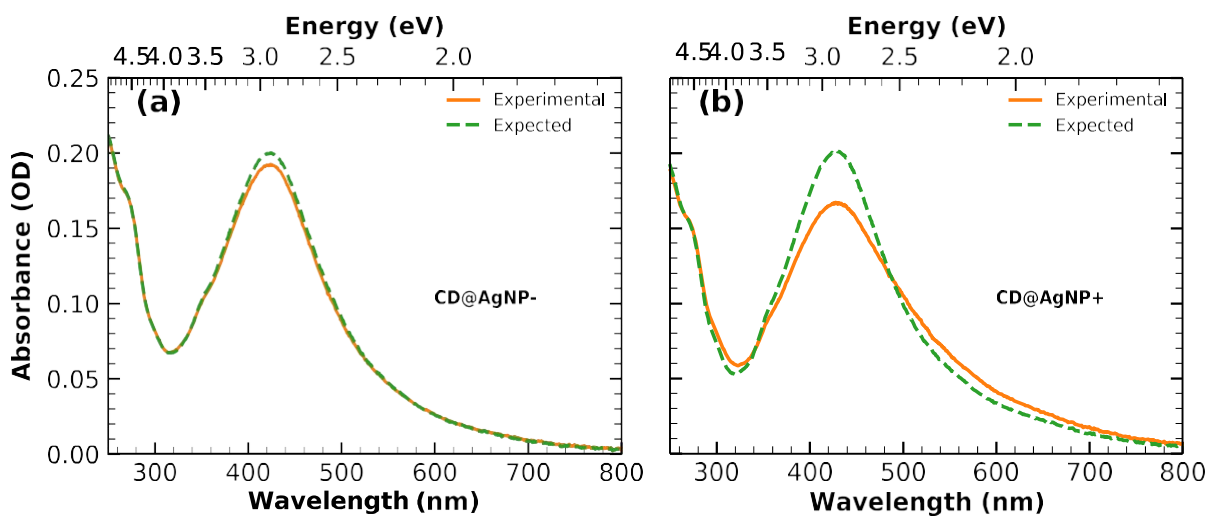


Figure S5 – The orange curves represent the experimental optical extinction spectra of mixed solutions of CD (60 nM) with (a) AgNP- (5 pM) and (b) AgNP+ (5pM). The dashed green curves represent the simple weighted sum of the experimental spectra of the two isolated constituents (i.e. no interactions).

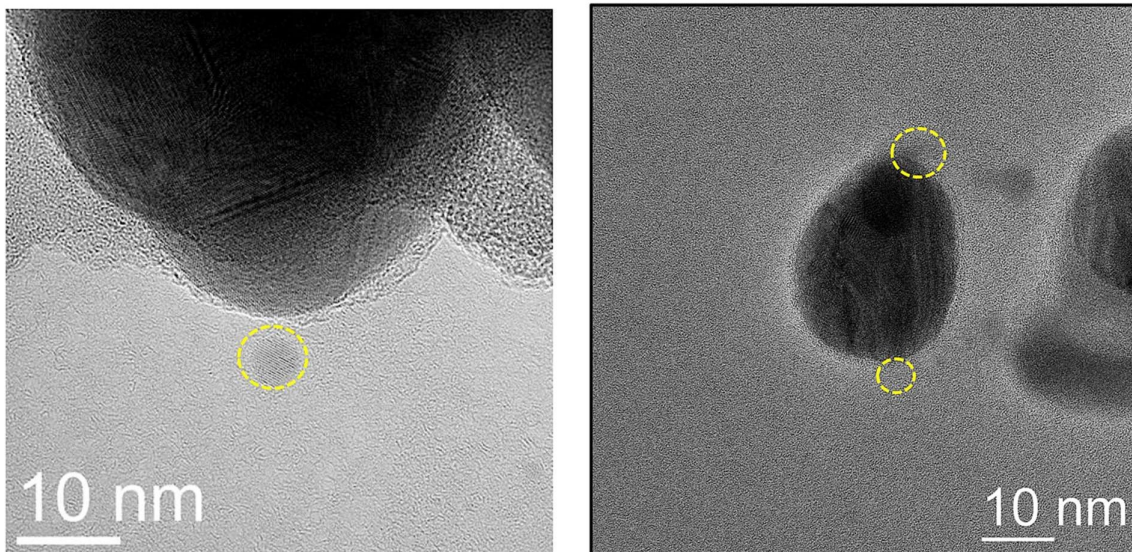


Figure S6 – HRTEM images of CD@AgNP- nanohybrids. Yellow circles highlight crystalline spots with sizes of 3-4 nm and low contrast which are due to carbon dots in close proximity to the surface of AgNPs.

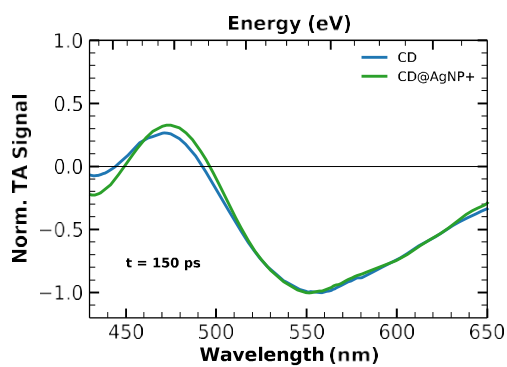


Figure S7 – Comparison of the normalized TA spectra of bare CD (blue) and CD@AgNP+ (green) recorded at 150 ps after photoexcitation at 400 nm.

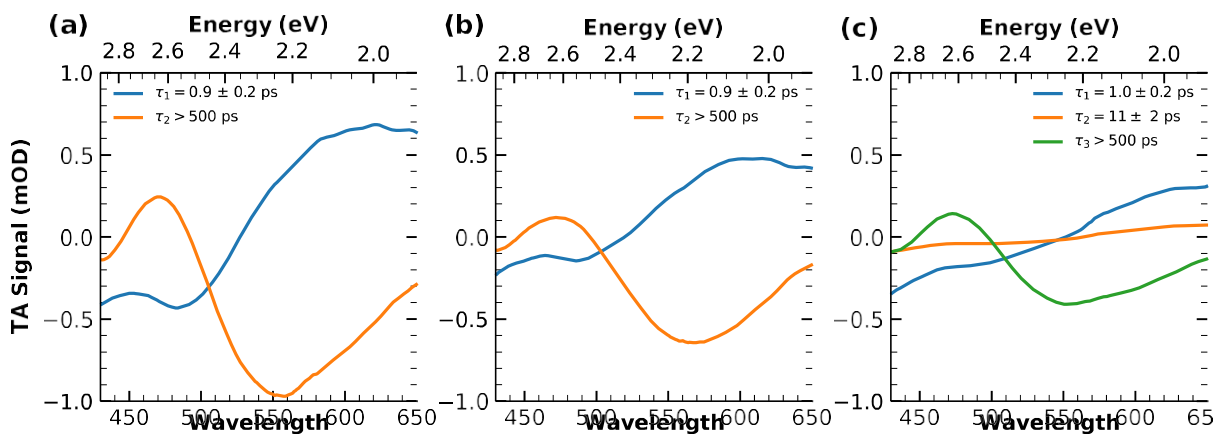


Figure S8 - DAS spectra from SVD analysis with the corresponding lifetimes of (a) bare CD, (b) CD@AgNP- and (c) CD@AgNP+ solutions.

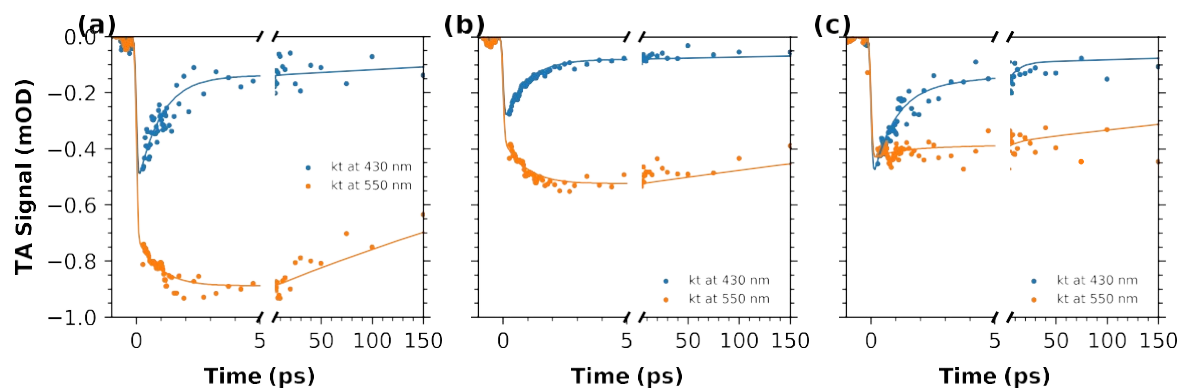


Figure S9 – Transient absorption time traces at 430 nm (blue) and 550 nm (orange), with the respective least-squares fitting curves (continuous lines) of CD (a), CD@AgNP- (b) and CD@AgNP- (c).