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Supporting information for

Expanding the color palette of bicolor-emitting nanocrystals

Corentin Dabard[1], Hong Po[1], Ningyuan Fu[1], Lina Makke[1], Henri Lehouelleur[1], Leonardo Curti[1], Xiang Zhen Xu[1], Emmanuel Lhuillier[2], Benjamin T. Diroll[3], Sandrine Ithurria[1*]

[1] Laboratoire de Physique et d'Etude des Matériaux, ESPCI-Paris, PSL Research University, Sorbonne Université Univ Paris 06, CNRS UMR 8213, 10 rue Vauquelin 75005 Paris, France.
[2] Sorbonne Université, CNRS, Institut des NanoSciences de Paris, INSP, F-75005 Paris, France.
[3] Center for Nanoscale Materials, Argonne National Laboratory, 9700 S. Cass Avenue, Lemont, Illinois 60439, United States

*To whom correspondence should be sent: sandrine.ithurria@espci.fr

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1 3 ML CdSe/CdTe core/crown NPLs growth and optical properties

Figure S 1 shows the properties of 3 ML CdSe and CdSe/CdTe core/crown NPLs. Compared to the main text where the CdTe crown is very small (3-5 nm of extension around the CdSe), here we extend it laterally to better show the associated absorption feature.

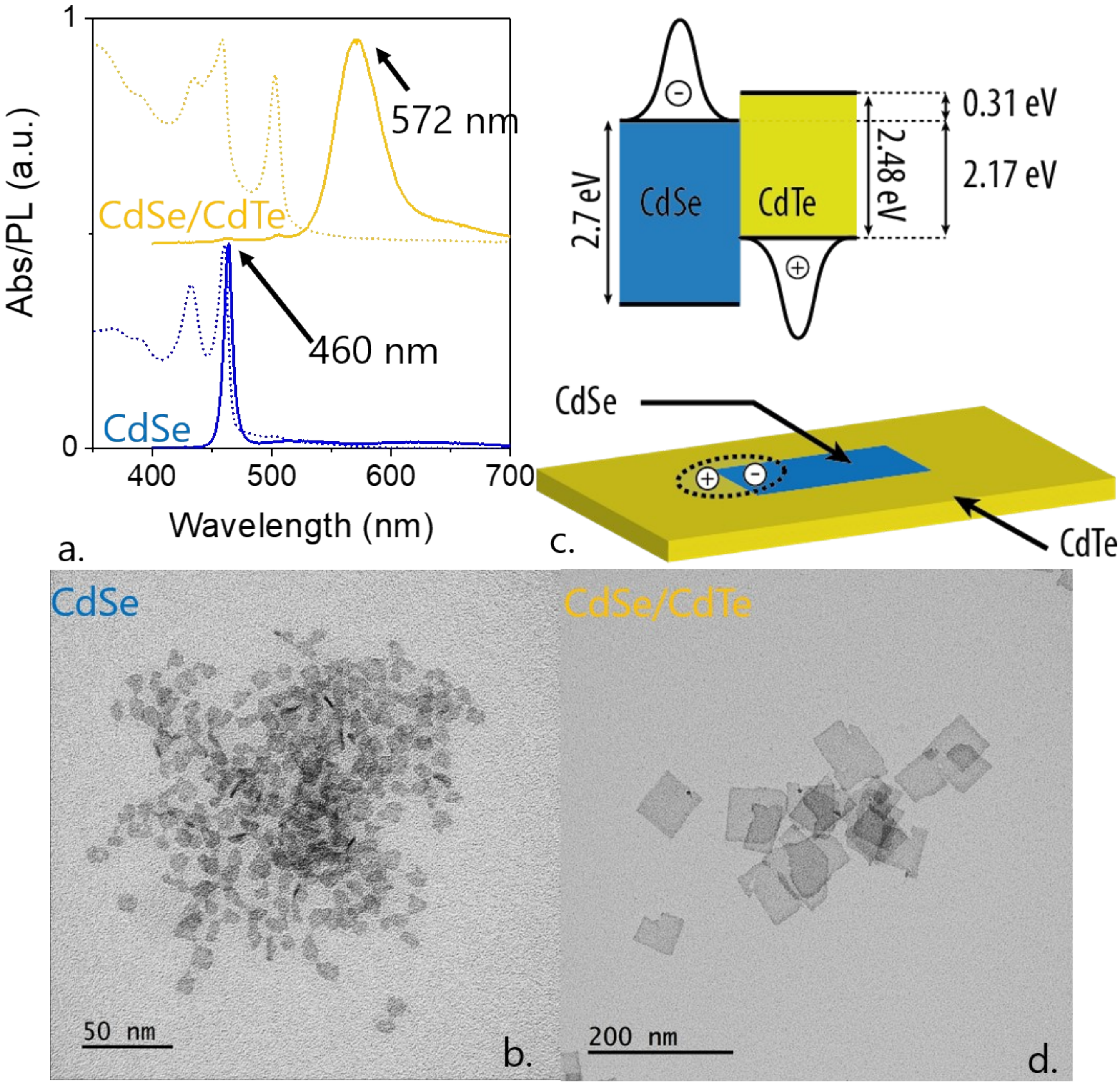

Figure S 1 Structural and spectroscopic properties of 3 ML CdSe core and CdSe/CdTe core/crown NPLs. *a. Absorption and photoluminescence spectra for CdSe core and CdSe/CdTe core/crown 3 ML NPLs. b. TEM image of the CdSe core 3 ML NPLs. c. Schematic of the band alignment and structure of the 3 ML CdSe/CdTe core/crown NPLs. d. TEM image of the CdSe/CdTe core/crown 3 ML NPLs.*

2 Absorption and transient absorption for 3 ML CdSe/CdTe/CdSe core/crown/crown NPLs

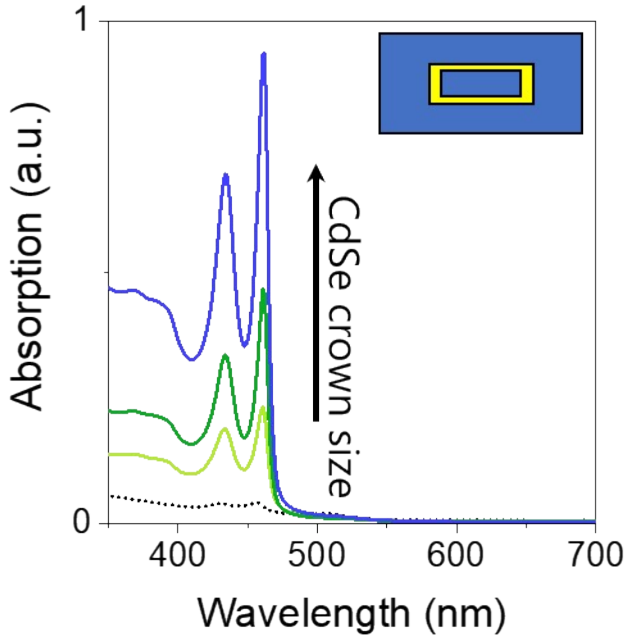

Figure S 2 Absorption spectra for 3 ML CdSe/CdTe/CdSe core/crown/crown NPLs *at various stages of the external CdSe crown growth.*

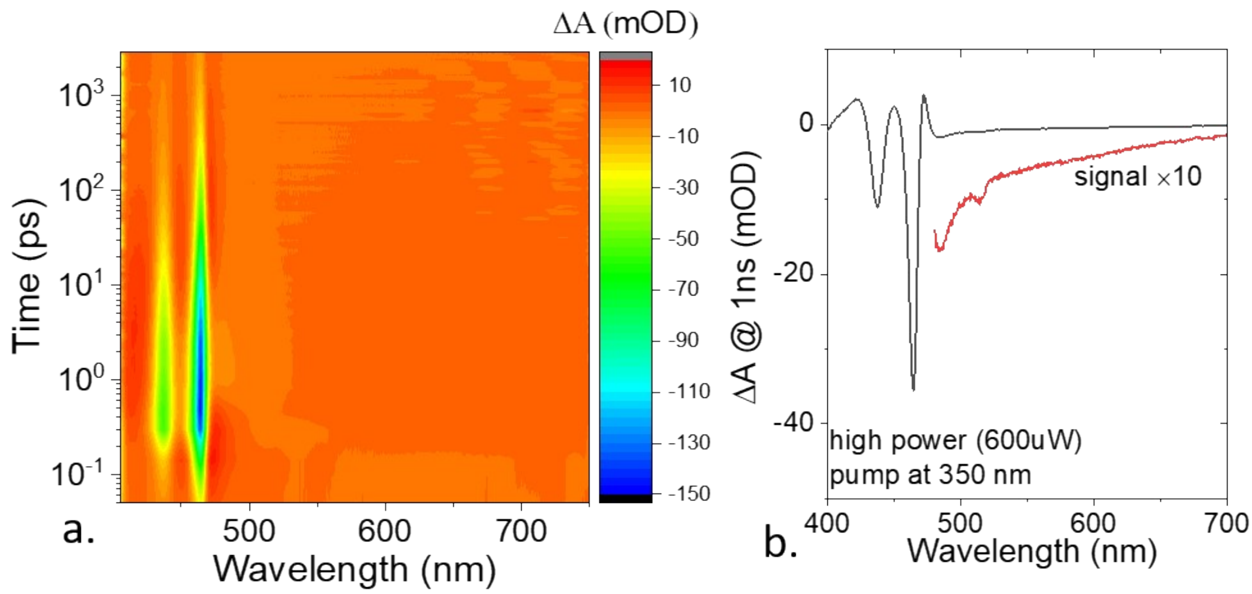

Figure S 3 *a.* ***Transient absorption map*** *(i.e. change in absorption spectrum vs time)* ***for 3 ML CdSe/CdTe/CdSe core/crown/crown NPLs*** *while the pump is at 400 nm (i.e. exciting both CdSe and CdTe). b. Transient absorption spectrum after 1 ns. Red curve is magnified 10 times to highlight the signal below CdSe band gap.*

3 Power-dependent spectra

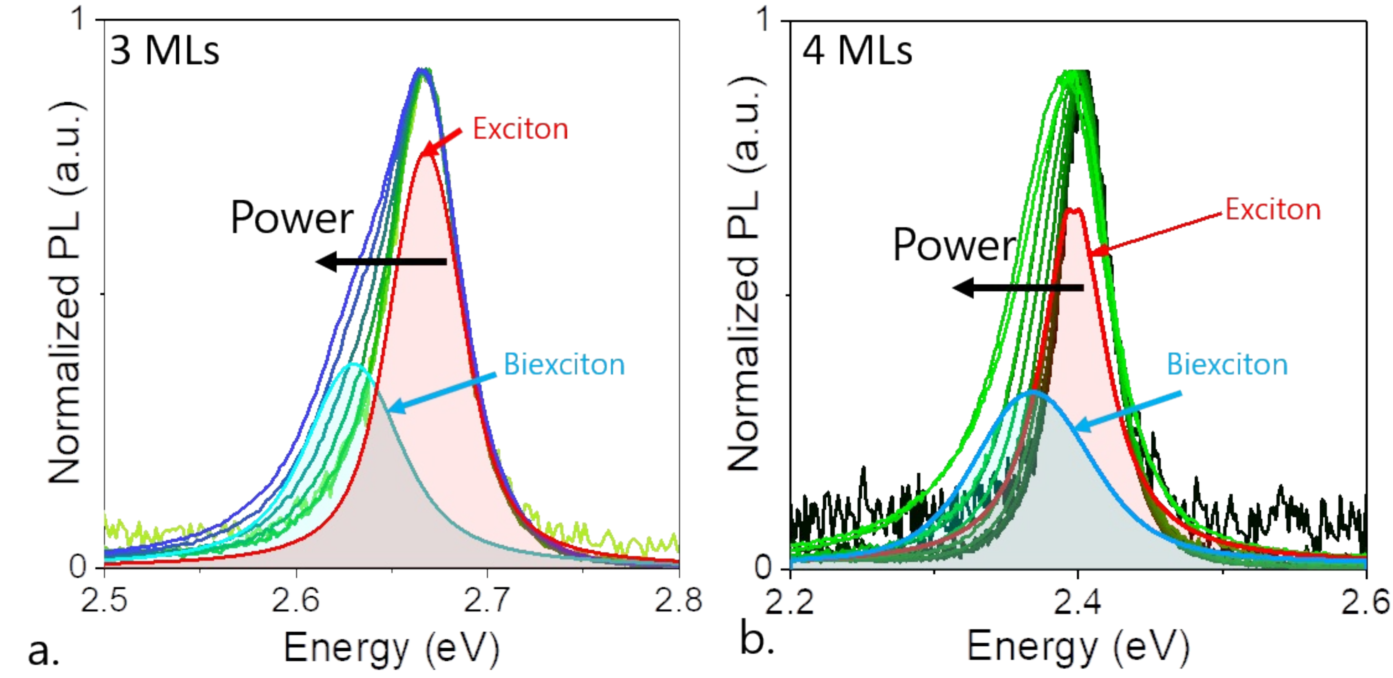

Figure S 4 CdSe emission broadening at high power. *a. Blue peak from 3 ML CdSe/CdTe/CdSe core/crown/crown NPLs under various incident fluences. The curves at high power are fitted with two contributions attributed to exciton and biexciton features. b. Same set of data from green emission in 4 ML thick NPLs.*

4 Carrier dynamics in 4 ML CdSe/CdS core/crown NPLs.

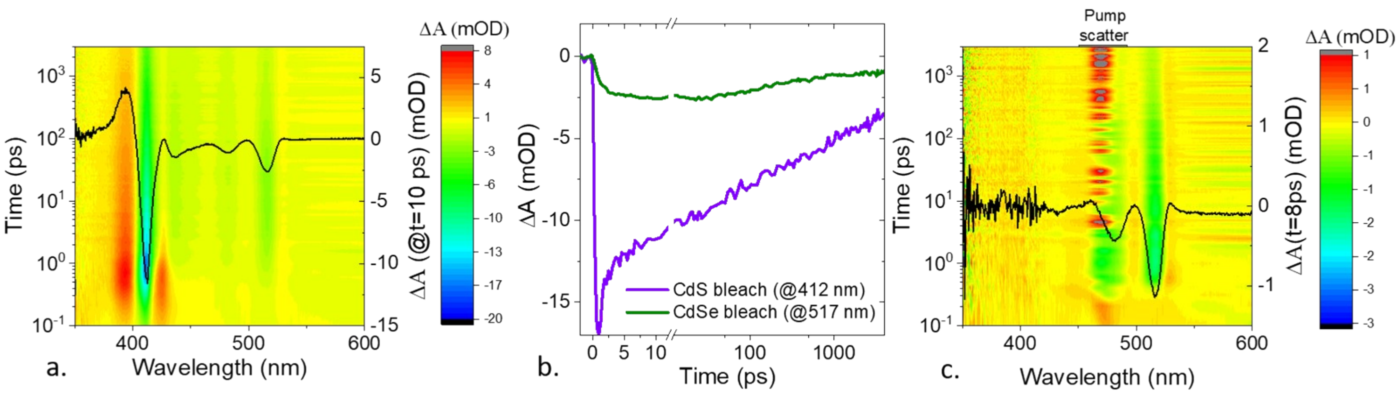

Figure S 5 Carrier dynamics in CdSe/CdS core/crown 4 ML thick NPL*. a. Transient absorption map (i.e. change in absorption spectrum vs time) for 4 ML CdSe/CdS core/crown NPLs while the pump is at 340 nm (i.e. exciting both CdSe and CdS). The black line corresponds to the signal at t=10 ps. b. Transient absorption as a function of time at 412 nm (i.e. at CdS band edge) and at 517 nm (i.e. at CdSe band edge) while the system is pumped at 450 nm. c. Transient absorption map (i.e. change in absorption spectrum vs time) for 4 ML CdSe/CdS core/crown NPLs while the pump is at 450 nm (i.e. below CdS band edge and thus exciting only CdSe). The black line corresponds to the signal at t=10 ps.*