Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics

TiO_2 hollow fibers for quantum dot sensitized solar cells

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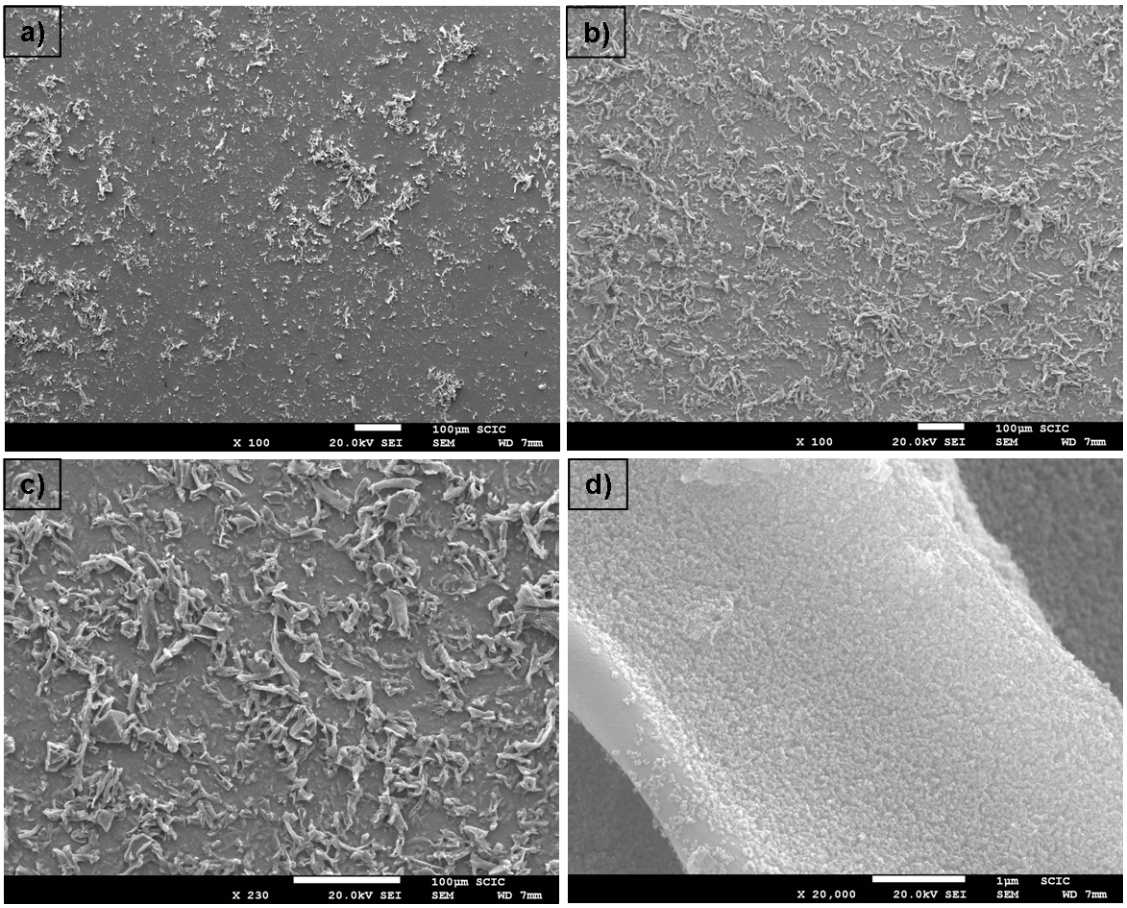
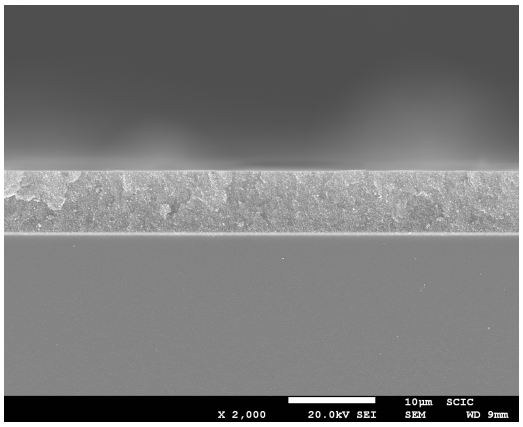
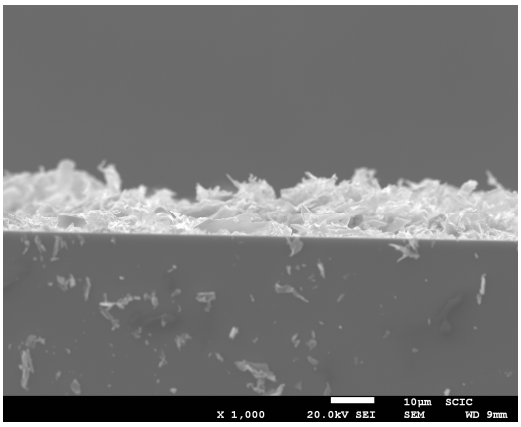


Fig S1: Typical SEM micrograph from T and X structures, a) F structure, b, c) X structure, d) Deposition of nanoparticles on one dimensional hollow fibers in X structures. Scale bare is 100 micron for a, b, c and is 1 micron for d.

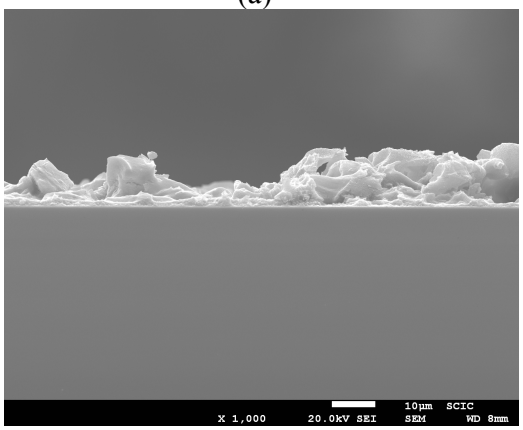
Fig S2.- Cross-sectional SEM micrographs for the T, F and X structures, a) T structure, b) F structure and c) X structure



(a)



(b)



(c)

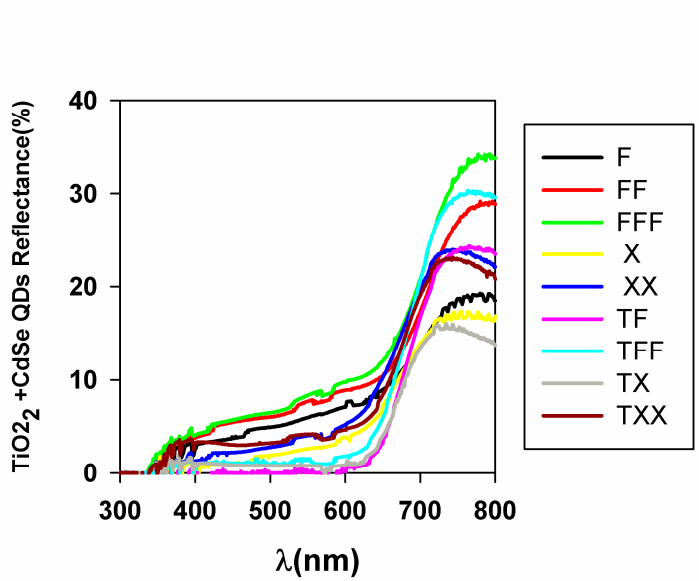


Figure S3: Diffuse reflectance spectra of the different structures after sensitization by 7 SILAR cycle of CdSe.

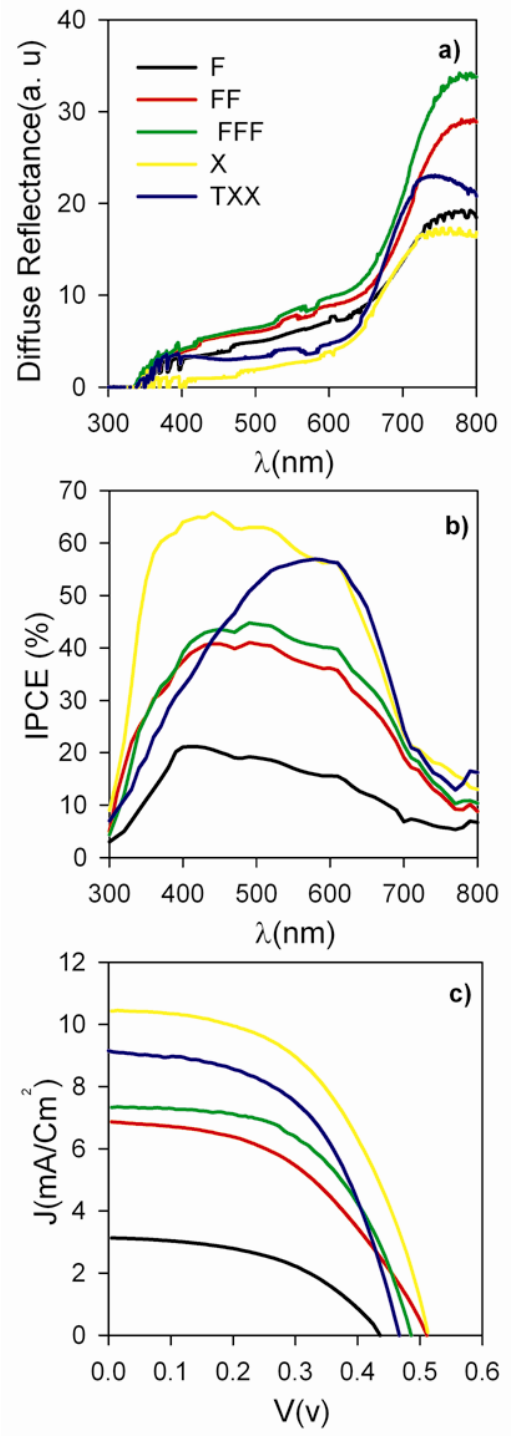


Figure S4: Diffuse reflectance (a), IPCE (b) and JV(c) curves for the F, FF, FFF, X, TXX structures which are sensitized by 7 SILAR cycle of CdSe.

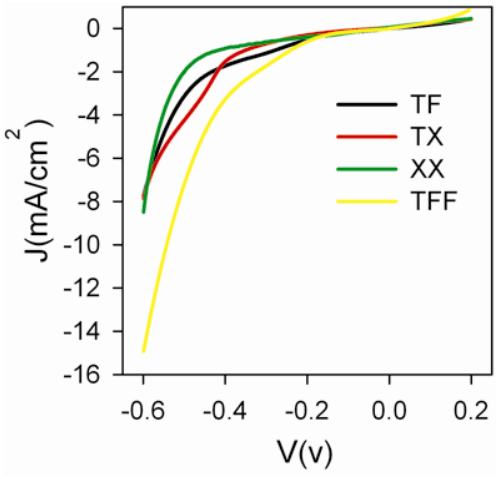


Figure S5: JV curves measured in dark for the TF, TX, XX and TFF structures which are sensitized by 7 SILAR cycle of CdSe.

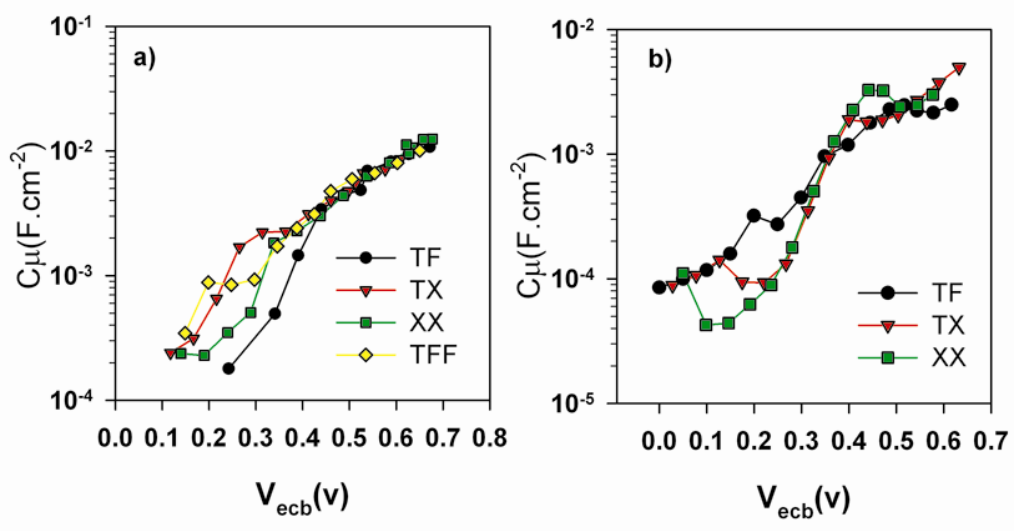


Figure S6: Correcting the effect of the position of the TiO_2 conduction band.
Voltage shift has been applied to the different C_μ curves plotted in Figure 4a and d to make them overlap, Figure S3a and b respectively, in order to correct the effect of TiO_2 conduction band displacement in SILAR and CBD sensitized cells. The voltage shift applied to each sample is indicated in Table S1 and Table S2 for SILAR and CBD sensitized cells respectively. The same shift performed on the chemical capacitance, Figure S3a,b and Table S1 and S2, has been carried out on the recombination resistance in order to plot it against V_{ecb}, see Figure 4b and e.

Table S1.- Thickness of the different electrodes tested in the present work.

Cell	Thickness(μm)
F	7±1
FF	10±1
FFF	15±1
X	7±1
XX	11±1
TF	11±1
TFF	15±1
TX	11±1
TXX	15±1

Table S2: Voltage shift carried out on Figure S6 (a), ΔE_{CB} (eV), in order to make the chemical Capacitances overlap and compare the cells with a common equivalent conduction band, Vecb. Sample TFF has been taken as reference sample (Ref.).

Cell Name	TF	TX	XX	TFF
ΔE_{CB} (eV)	0.093	0.068	0.14	Ref.

Table S3: Voltage shift carried out on Figure S6 (b), ΔE_{CB} (eV), in order to make the chemical capacitances overlap and compare the cells with a common equivalent conduction band, Vecb. The TF sample exhibits a different slope, see the main text, and consequently, no shift has been performed on this sample. Sample XX has been taken as reference sample (Ref.).

Cell Name	TX	XX
ΔE_{CB} (eV)	0.028	Ref