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Amplification of Active Sites and Porosity for QDs Adsorption Via Induction of Rare Earth Element La into TiO_2 for Boosting Photovolatic Effect in QDSSC's

R. Shwetharani[ab], T. Sushmitha[a], G U Preethi[a], R. Geetha Balakrishna[a]*

a: Centre for Nano and Material Sciences, Jain Global Campus, Jain University, Bangalore rural, 562112, India

b: Department of Chemistry, School of Engineering Technology, Jain University, Bangalore rural, 562112, India

*Corresponding author: br.geetha@jainuniversity.ac.in

Supporting Information:

Table S1. Elemental analysis of TiO_2 and 4 % La-TiO_2

Material	Element	Weight (%)	Atomic (%)
TiO_2	O K	46.08	71.9
	Ti K	53.92	28.1
4 % $LaTiO_2$	O K	29.66	60.53
	Ti K	51.37	35.01
	La L	18.97	4.46

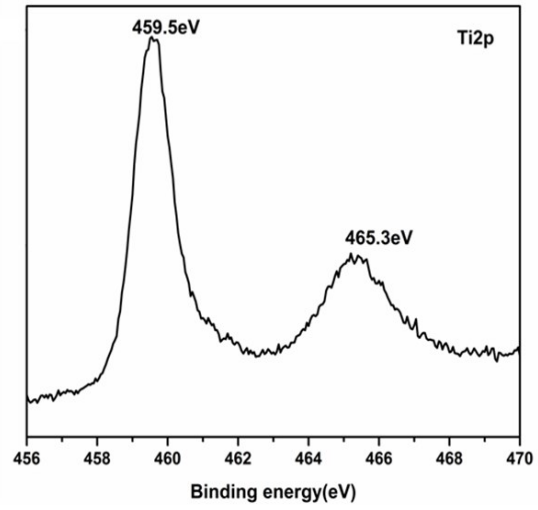
Table S2. Elements present in La-TiO_2/CdS/ZnS

Element	Weight %	Atomic %
O K	29.37	45.22
S K	5.85	10.05

CdL	13.65	6.69
TiK	35.55	30.52
LaL	10.35	4.11
ZnK	5.23	4.41

Table S3. BET surface area and pore volume values of TiO_2 and $LaTiO_2$

Nanomaterial	**Surface area m^2/g**	**Pore volume Cm^3g^{-1}**	**Pore diameter nm**
TiO_2	17.2	0.03384	8.9346
1 % $LaTiO_2$	41.536	0.0816	7.862
2 % $LaTiO_2$	47.741	0.0784	6.573
3 % $LaTiO_2$	86.808	0.2322	10.702
4 % $LaTiO_2$	97.246	0.255	10.49
5 % $LaTiO_2$	61.595	0.137	7.857



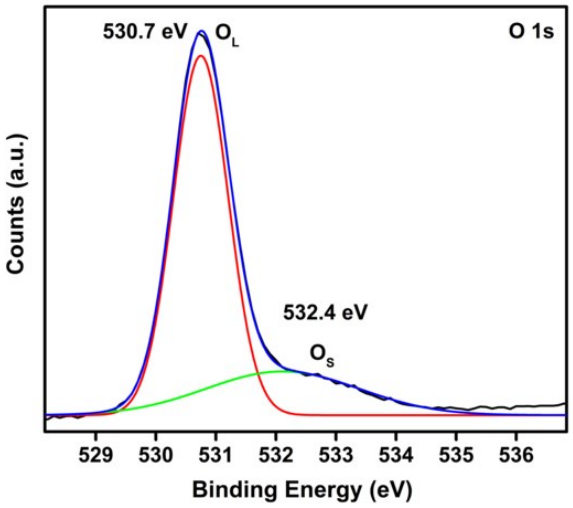


Figure S1. XPS spectra of Bare TiO_2

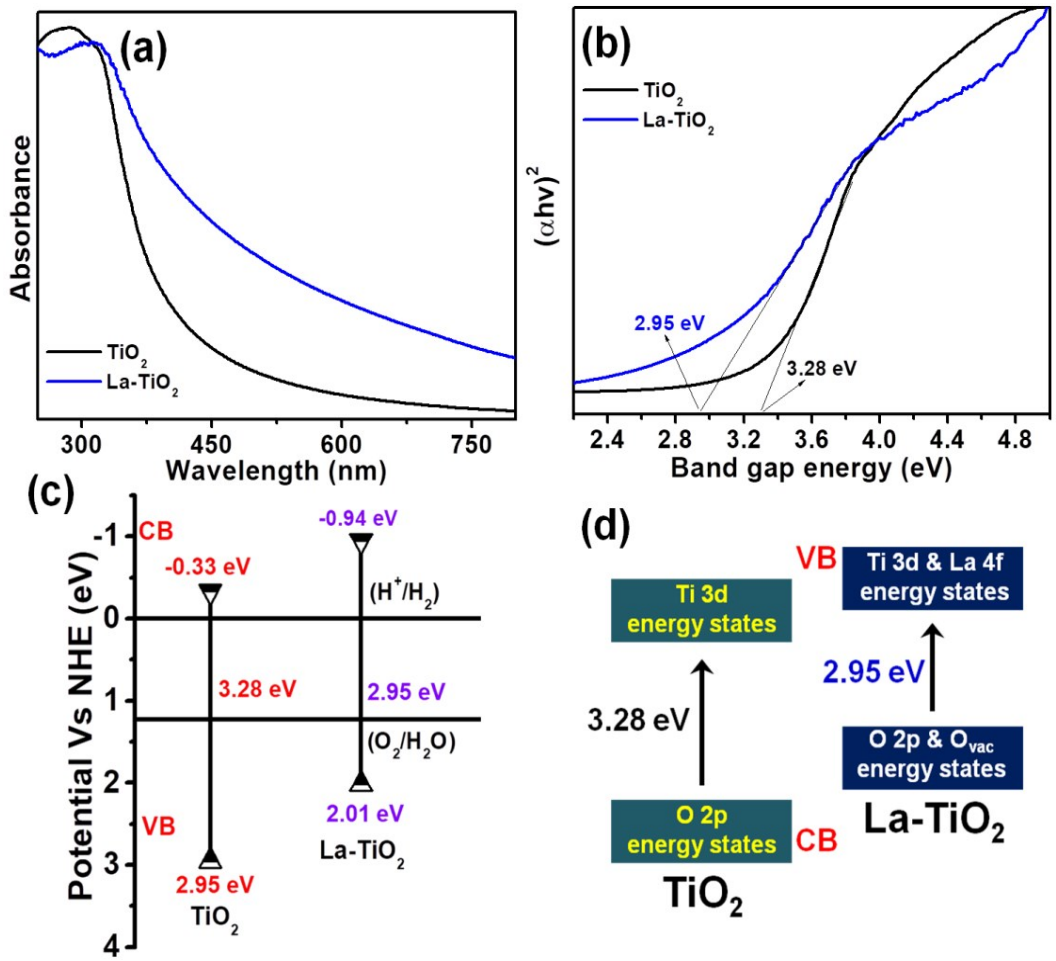


Figure S2 a) UV-visible absorption spectra of TiO_2 and 4% La-TiO_2 b) Tau plot of TiO_2 and 4% La-TiO_2 (c)-(d) Calculated and depicted band edge potential of TiO_2 and La-TiO_2.

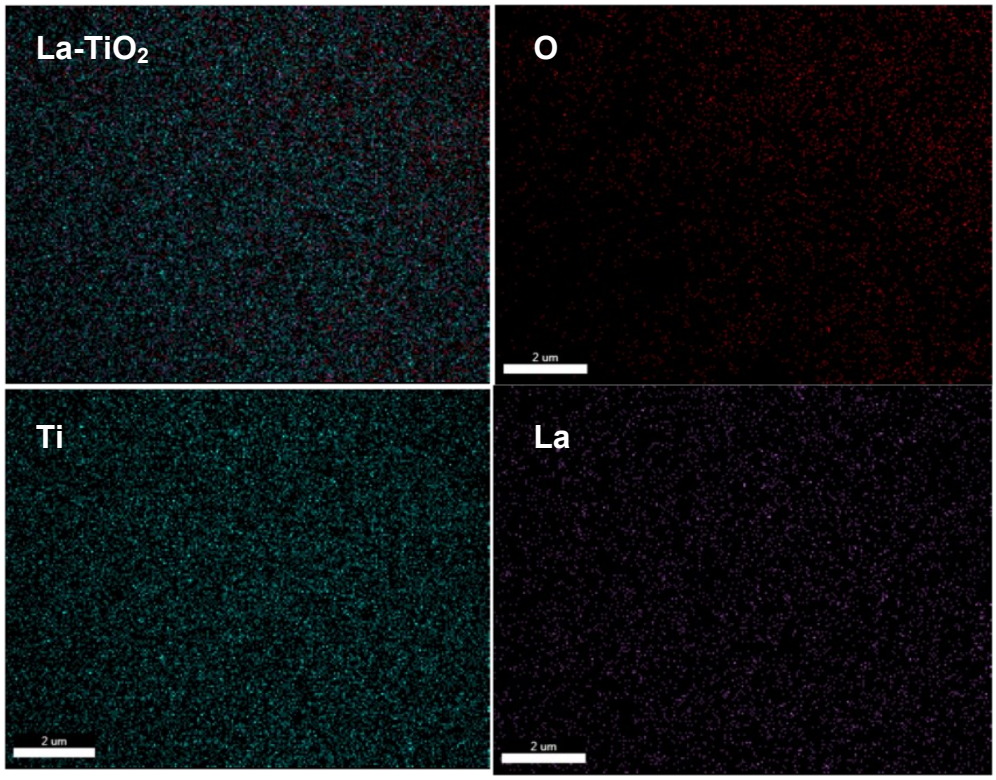


Figure S3. EDX mapping images of 4 % La-TiO_2

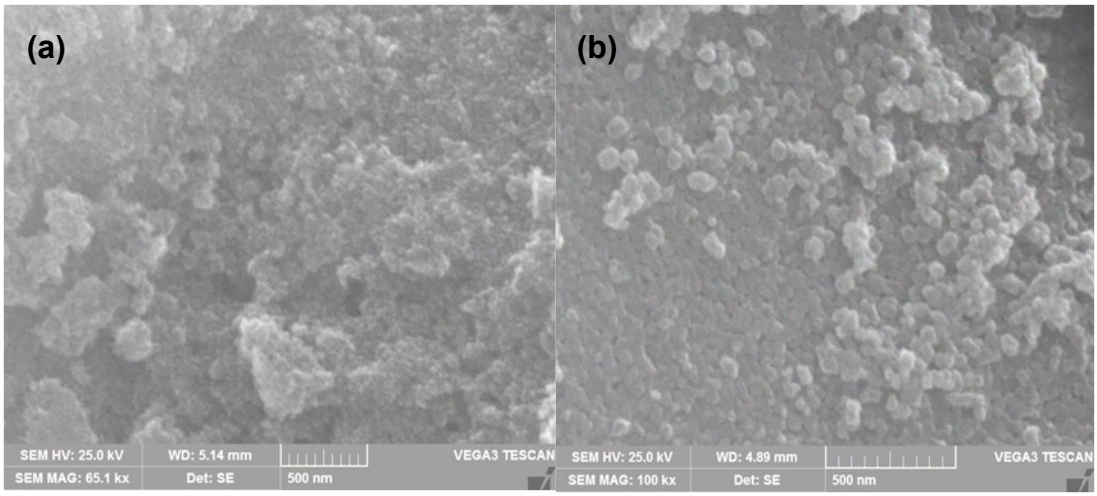


Figure S4. SEM images of a) La-TiO_2/CdS/ZnS b) TiO_2/CdS/ZnS

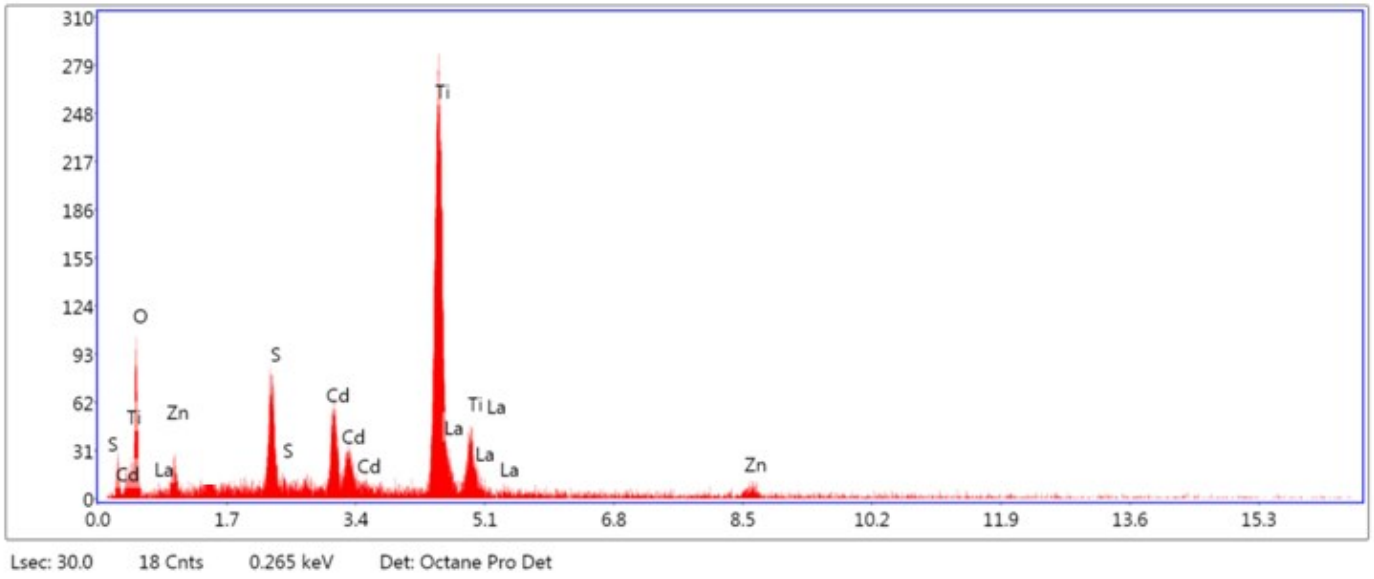


Figure S5. EDX analysis curve of La-TiO_2/CdS/ZnS

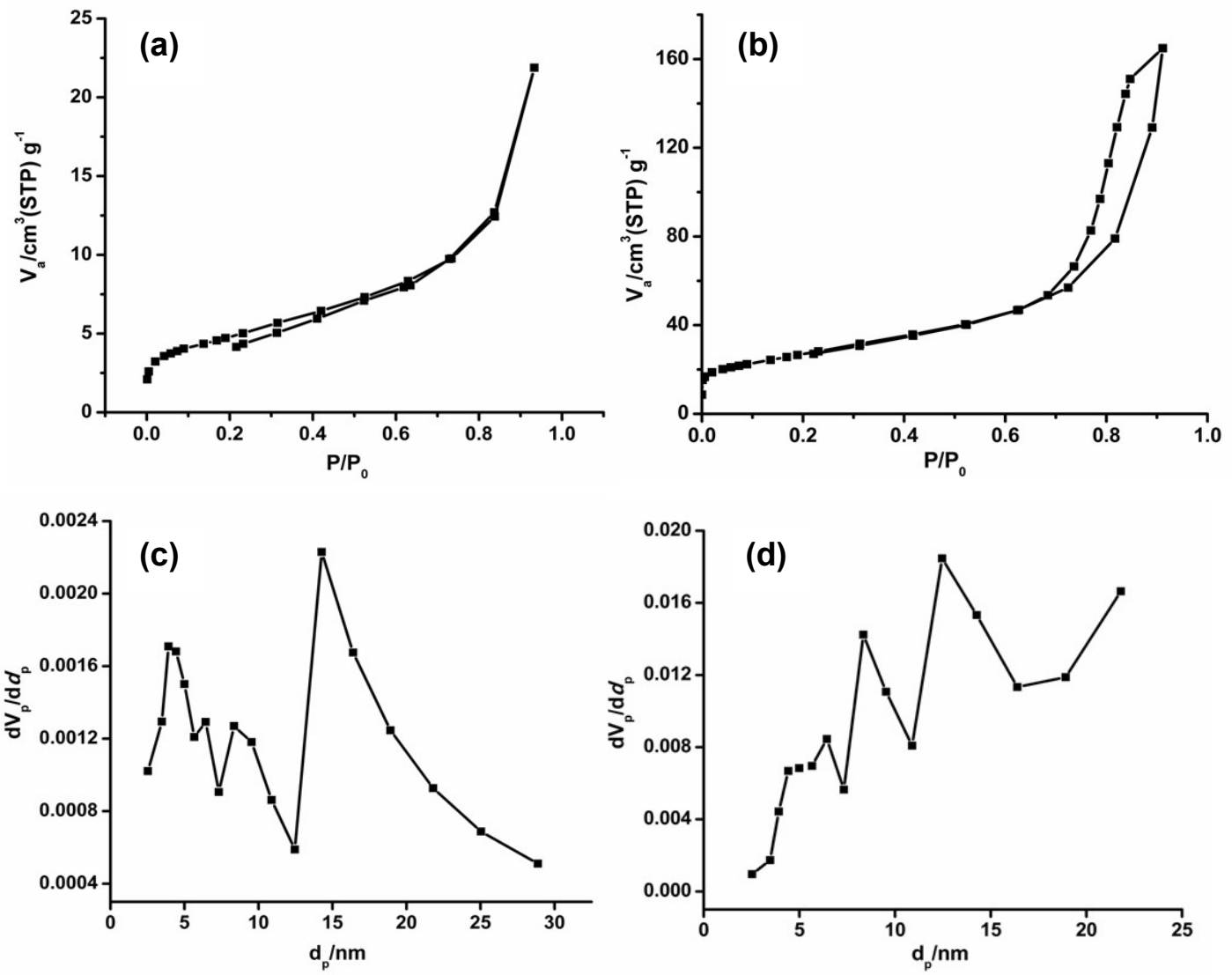


Figure S6. BET adsorption-desorption isotherms of a) TiO_2 b) $LaTiO_2$ and BJH pore size distribution of c) TiO_2 d) 4 % $LaTiO_2$

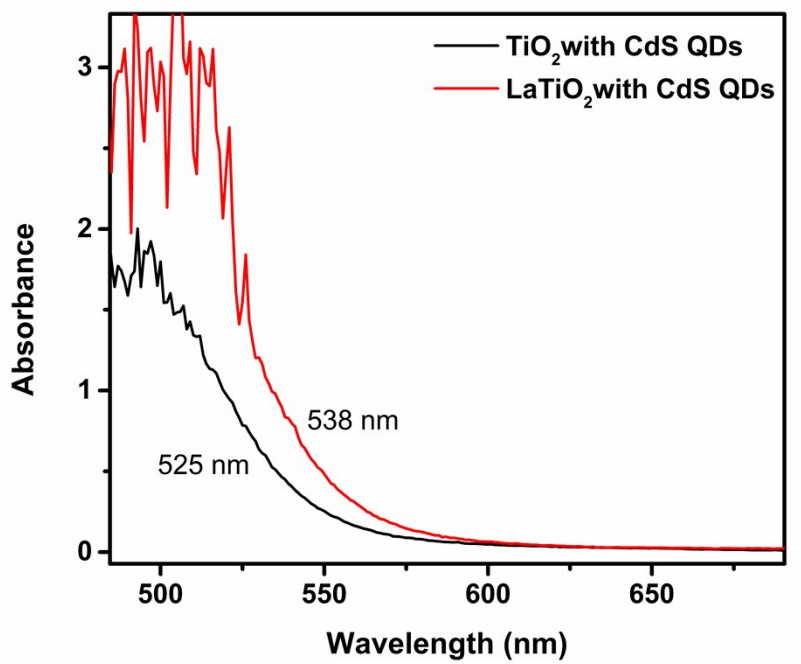


Figure S7. UV-visible absorption spectra of TiO_2 and La-TiO_2 with SILAR deposited CdS QDs