Supplementary Information

Facile Synthesis of Phosphine Free Ultra-Small PbSe Nanocrystals and Their Light Harvesting studies in ETA Solar Cell

Javeed Akhtar,*[a,b] Mateusz Banski,[c] Mohammad Azad Malik,[d] Neerish Revaprasadu,[e] Artur Podhorodecki,[c] and Jan Misiewicz,[c]

[a] Department of Physics, Nanoscience & Materials SynthesisLab, COMSATS, Institute of Information Technology, Park Road, Islamabad 44000, Pakistan

[b] Department of chemistry, The university of Azad Jummu and kashmir Muzaffrabad, Pakistan

[c] Institute of Physics, Wroclaw University of Technology, Wybrzeze Wyspianskiego 27, Wroclaw, 50-370, Poland,

[d] School of Chemistry and Materials Science Centre, The University of Manchester Oxford Road, Manchester, M13 9PL ,UK

[e] Department of Chemistry, University of Zululand, Private Bag X1001, KwaDlangezwa, 3880, South Africa.

Correspondence

Email: javeedkt@gmail.com

Table S1. Preparation of PbSe NCs and optical parameters

Sample ID	Synthesis time (min.)	Average size (nm), UV-vis/(XRD)	Average size (nm)**	1st absorption peak (nm)	Stock shift (meV)	effective relaxation time ⟨τ⟩ µs	β parameter
C-1	1	1.5* (1.8)	1.7±0.3	570	610	1.75	0.80
C-2	2	1.6* (2.1)	1.8±0.5	600	550	0.95	0.80
C-5	5	2.15* (2.2)	2.12±0.6	780	190	1.10	0.89

* absorption peak positions and empirical relation proposed by Quanqin Dai et al.[13]
( ) size calculated by using Scherrer equation, PXRD
** from TEM

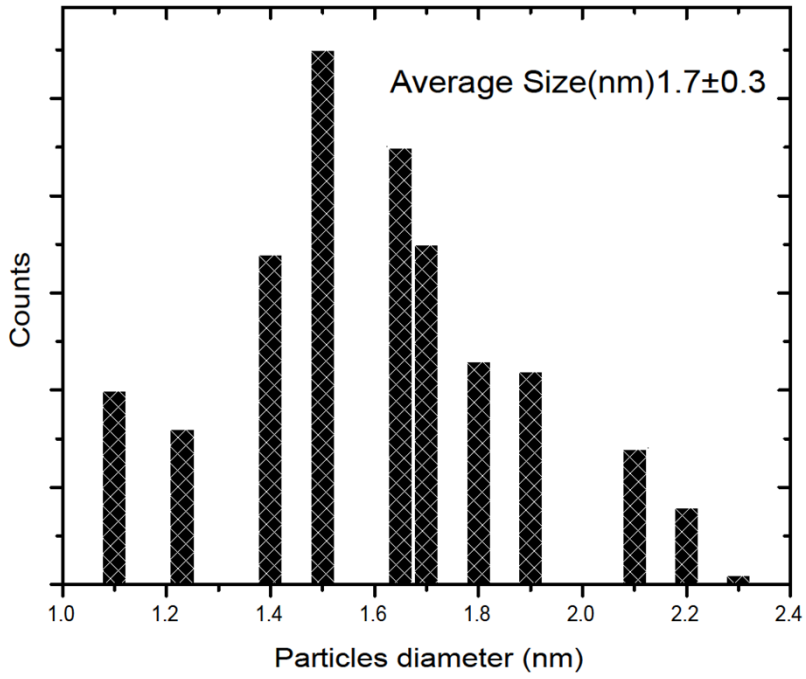

Figure S1. Size distribution profile of PbSe nanocrystals determined from HR-TEM of sample C-1

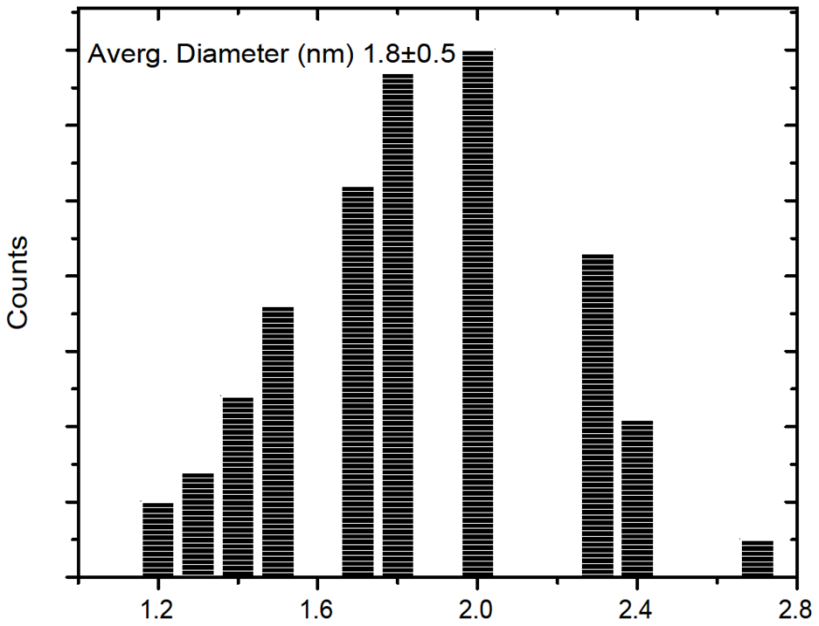

Figure S2. Size distribution profile of PbSe nanocrystals determined from HR-TEM of sample C-2

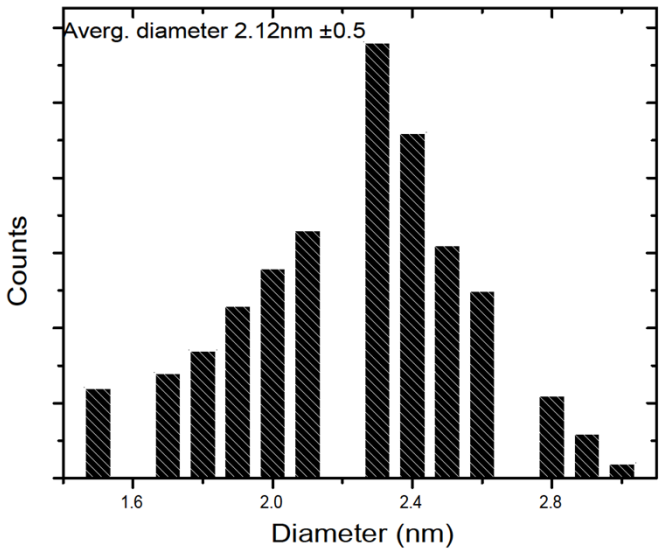

Figure S3. Size distribution profile of PbSe nanocrystals determined from HR-TEM of sample C-5

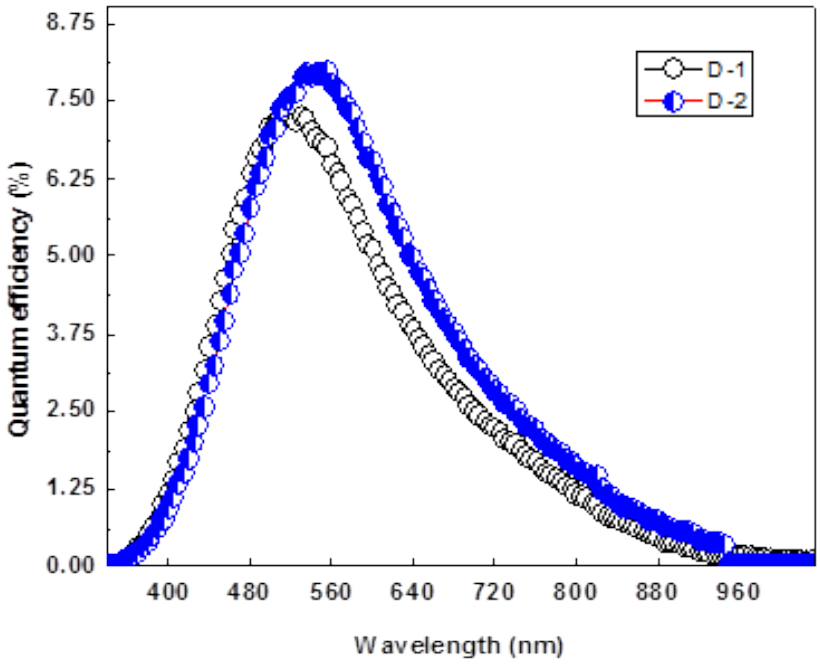

Figure S4. Incident photons to energy conversion efficiency (IPCE) spectra of D-1 and D-2 electrodes