

## Supporting Information

### Effective defect passivation of CsPbBr<sub>3</sub> quantum dots using gallium cations toward the fabrication of bright perovskite LEDs

Jiantai Wang<sup>a</sup>, Yushuai Xu<sup>b,c</sup>, Shenghan Zou<sup>a</sup>, Chao Pang<sup>a</sup>, Ruimin Cao<sup>a</sup>, Zhangxu

Pan<sup>a</sup>, Chan Guo<sup>a</sup>, Shiben Hu<sup>a</sup>, Jiucheng Liu<sup>a</sup>, Zhiyuan Xie<sup>\*b,c</sup>, Zheng Gong<sup>\*a</sup>

Dr. J. T. Wang, Dr. S. H. Zou, Dr. C. Pang, Dr. R. M. Cao, Z. X. Pan, Dr. C. Guo, Dr. S. B. Hu, J. C. Liu, Prof. Z. Gong

<sup>a</sup> Institute of Semiconductors, Guangdong Academy of Sciences, No. 363 Changxing Road, Tianhe District, Guangzhou, P. R. China.

Email: zheng\_gong@gdisit.com

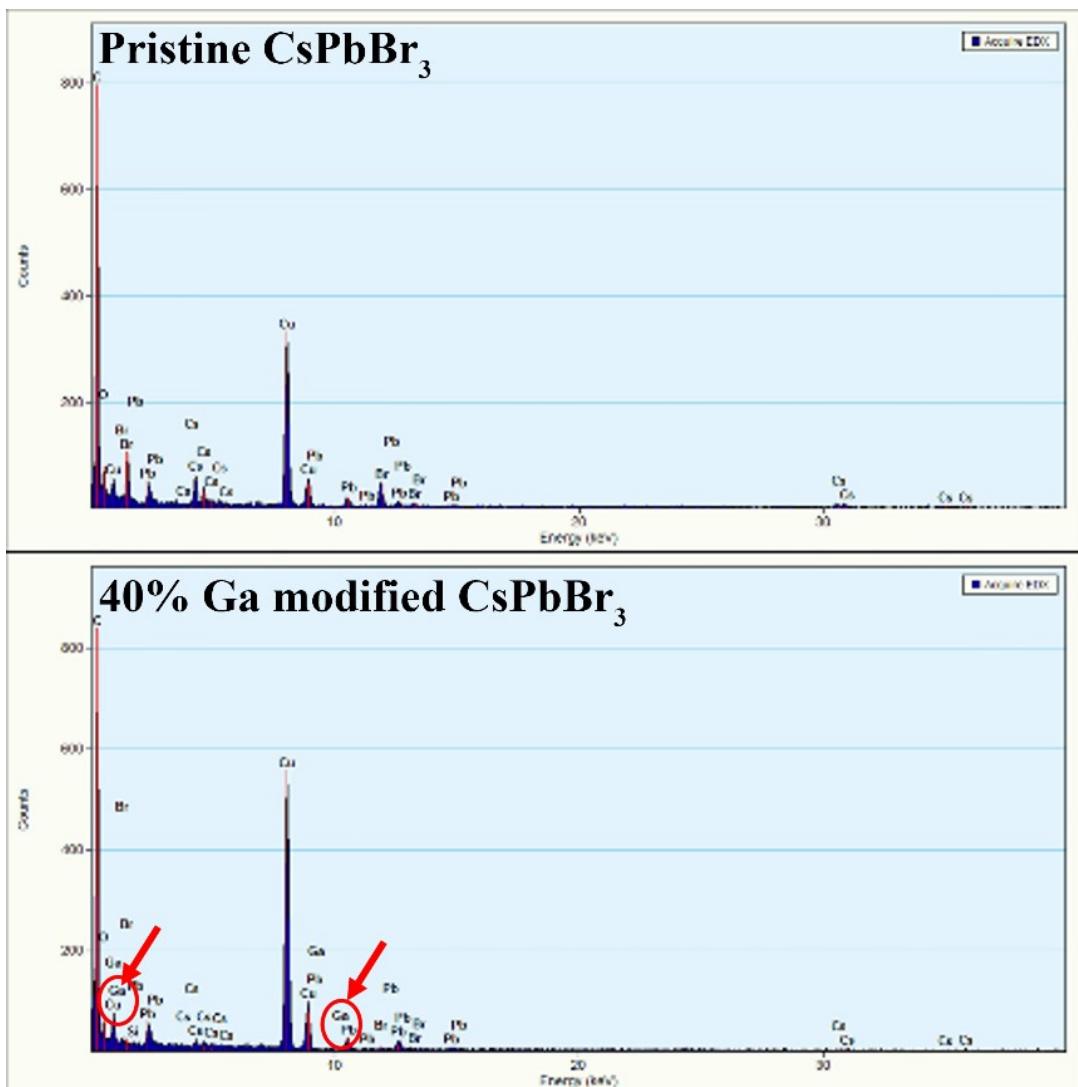
Y. S. Xu, Prof. Z. Y. Xie

<sup>b</sup> State Key Laboratory of Polymer Physics and Chemistry, Changchun Institute of Applied Chemistry, Chinese Academy of Sciences, Changchun, 130022, P. R. China.

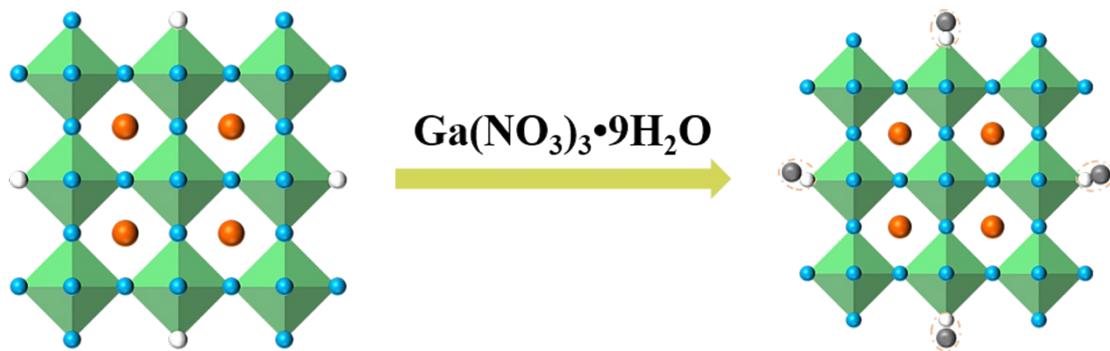
Email: xiezy\_n@ciac.ac.cn

Y. S. Xu, Prof. Z. Y. Xie

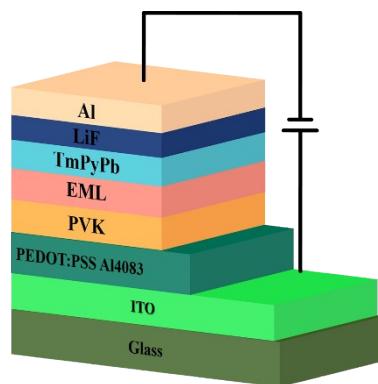
<sup>c</sup> University of Science and Technology of China, Hefei, 230026, P. R. China



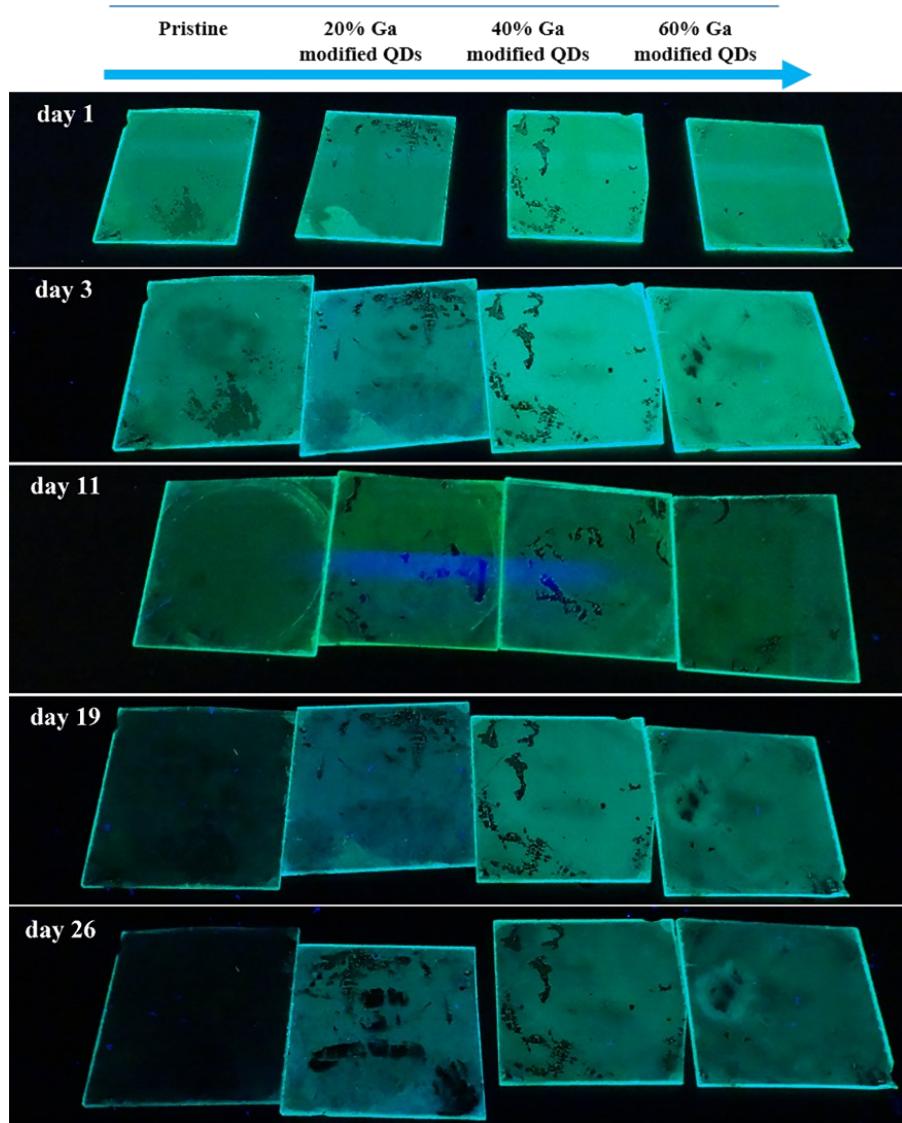
**Fig. S1.** Energy dispersive X-ray Spectrometry (EDS) spectra of the pristine and 40% Ga ions modified  $\text{CsPbBr}_3$  QDs .



**Fig. S2.** Schematic diagram of the grain boundary passivation mechanism for Ga modified  $\text{CsPbBr}_3$  QDs.



**Fig. S3.** Schematic device structure of the Perovskite QDs-based LEDs



**Fig. S4** PL emission photographs for different Ga ions modified CsPbBr<sub>3</sub> QDs coated on a glass slide taken under different UV irradiation time.

**Table S1.** The final Ga and Pb elemental concentrations of 40% Ga-modified CsPbBr<sub>3</sub> QDs (detection with ICP-OES)

Element	Ga	Pb
Concentration (mg/kg)	450.4	211296.8
Concentration (%)	0.05%	21.13%