

## Electronic Supplementary Information (ESI)

# High Performance Blue Quantum Dot Light-Emitting Diodes Employing the Polyethylenimine Ethoxylated as the Interfacial Modifier

Ying-Li Shi,<sup>a</sup> Feng Liang,<sup>a</sup> Yun Hu,<sup>a</sup> Ming-Peng Zhuo,<sup>a</sup> Xue-Dong Wang<sup>\*,a</sup> and

Liang-Sheng Liao<sup>\*,a,b</sup>

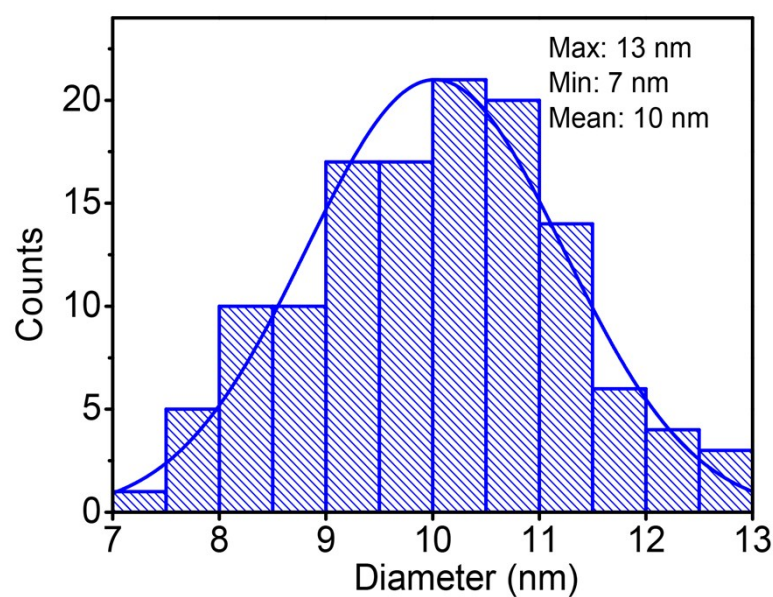
<sup>a</sup>Jiangsu Key Laboratory for Carbon-Based Functional Materials & Devices,  
Institute of Functional Nano & Soft Materials (FUNSOM), Soochow University,  
Suzhou, Jiangsu 215123, China

<sup>b</sup>Institute of Organic Optoelectronics, JITRI, Wujiang, Suzhou, Jiangsu 215211,  
China

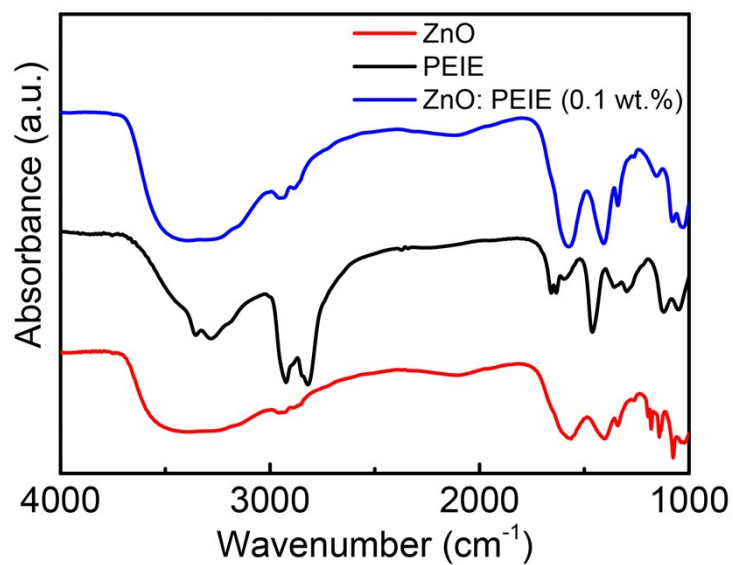
E-mail: lsiao@suda.edu.cn; wangxuedong@suda.edu.cn

## Experimental details

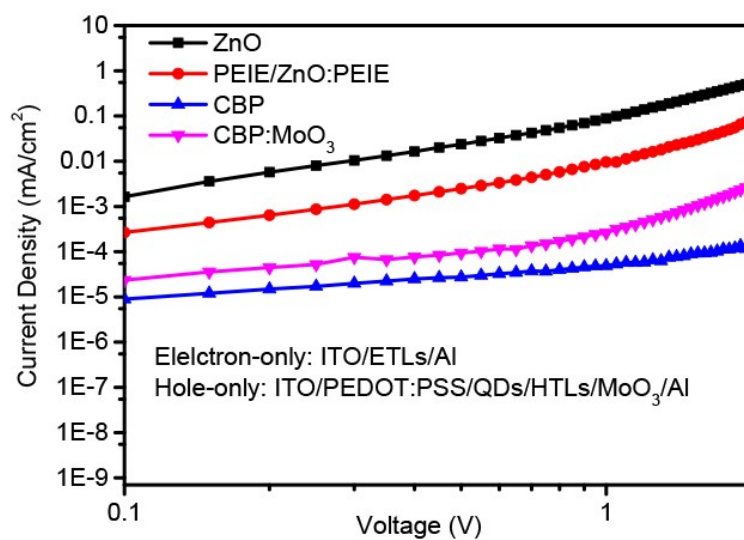
ZnCdS/ZnS core-shell QDs were provided by the Poly OptoElectronics Company. Zinc acetate hydrate, and PEIE (30-40 wt.%, in water) were purchased from Sigma-Aldrich. *N*-hexane, and *n*-butylalcohol were purchased from Acros. Ethyl acetate, tetramethylammoniumhydroxide (TMAH), dimethylsulphoxide (DMSO) were purchased from Alfa-Aesar. Acetone was purchased from Sinopharm Chemical Reagents. All reagents used in this study were without any other purification.



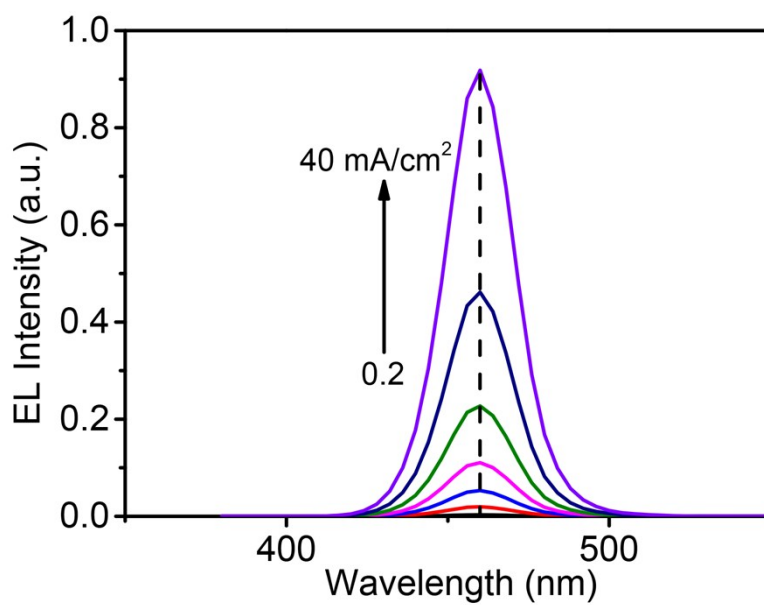
**Fig. S1** The diameter distribution of blue QDs with the mean size of 10 nm.



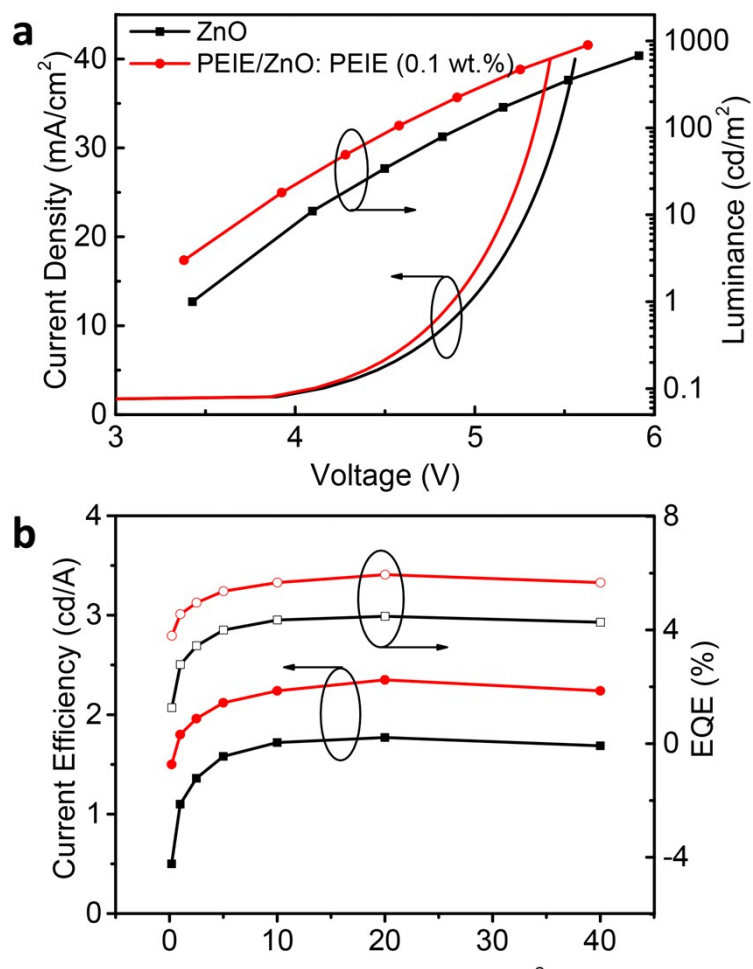
**Fig. S2** The TR-FTIR spectra of the ZnO, PEIE and PEIE doped ZnO (0.1 wt.%) films.



**Fig. S3** Electrical measurements of the hole-only and electron-only devices.



**Fig. S4** The EL spectra at different current densities of the device (0.1 wt.%). It should be noticed that the FWHM of EL spectra showed no obvious broadening when QLEDs were measured at current density from 0.2 to 40 mA/cm<sup>2</sup>.



**Fig. S5** The device performance of the fabricated QLEDs using pure CBP as the HTL.

(a) Current density and luminance versus driving voltage. (b) Current efficiency (solid symbols) and external quantum efficiency (hollow symbols) versus current density.

**Table S1.** The summary of the devices performance

Device	$\lambda_{\max}$ (nm)	FWHM (nm)	CIE (x, y)	$\eta_A$ (cd/A)	$\eta_{EQE}$ (%)	$\eta_P$ (lm/W)
ZnO	460	24	(0.144, 0.036)	1.77	4.48	1.05
Modified EILs	460	24	(0.144, 0.036)	2.35	5.95	1.46