

Supplementary Information

Emissive CdTe-ZnO-GO Quasi-Core-Shell-Shell Hybrid Quantum Dots for White Light Emitting Diodes

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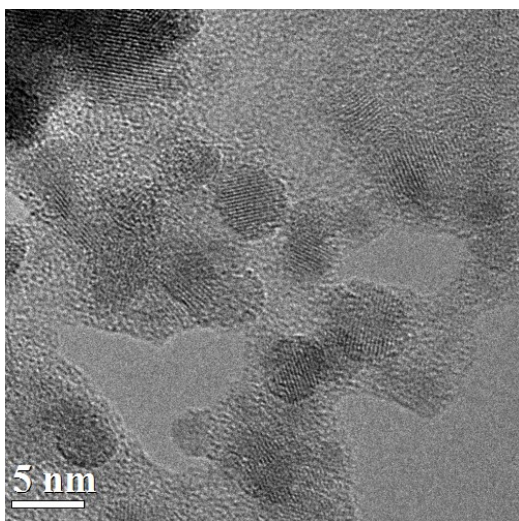
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(a)



(b)

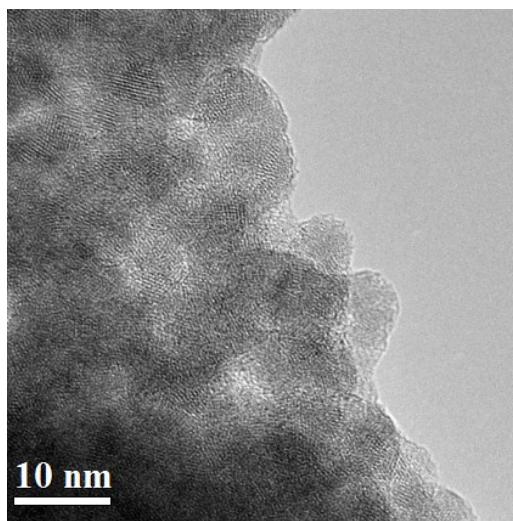


Figure S1. HRTEM image of (a) CdTe-TGA and (b) CdTe/ZnO QDs.

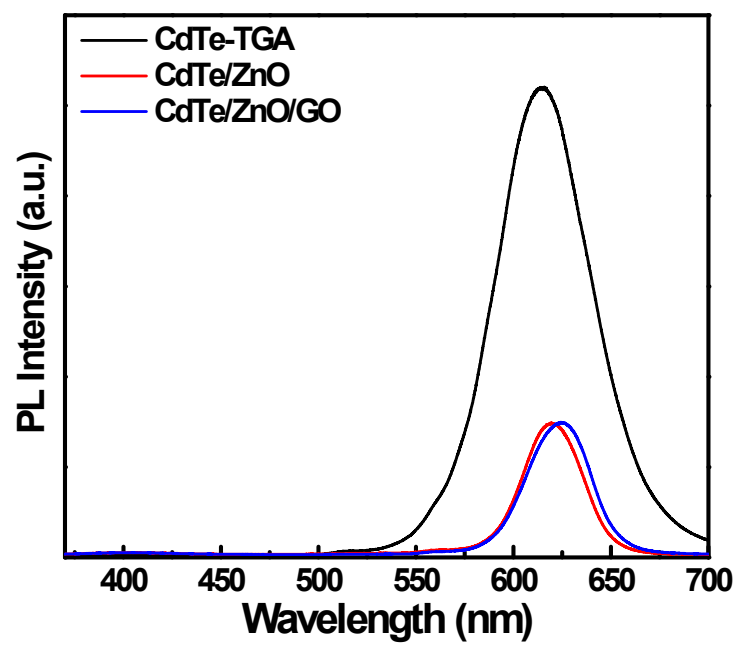


Figure S2. Photoluminescence spectra of CdTe-TGA, CdTe/ZnO and CdTe/ZnO/GO QDs, respectively.

Table S1. TRPL decay times of CdTe-TGA, CdTe/ZnO, and CdTe/ZnO/GO QDs.

Sample	Detect Wavelength (nm)	Decay Time (ns) τ_1	Decay Time (ns) τ_2	Normalized Fit function
CdTe-TGA	615 nm	3.054	18.087	$0.620e^{-\tau/\tau_1} + 0.380e^{-\tau/\tau_2}$
CdTe/ZnO	620 nm	2.646	12.760	$0.708e^{-\tau/\tau_1} + 0.292e^{-\tau/\tau_2}$
CdTe/ZnO/GO	625 nm	2.149	10.851	$0.725e^{-\tau/\tau_1} + 0.275e^{-\tau/\tau_2}$

Table S2. Photoluminescence and electroluminescence transition mechanisms for CdTe/ZnO/GO QDs.

Transition	Photoluminescence	Electroluminescence
$CB_{ZnO} \rightarrow VB_{ZnO}$	382 nm (3.24 eV)	X
Defect band $\rightarrow VB_{ZnO}$	404 nm (3.05 eV)	X
$(LUMO^{+2})_{GO} \rightarrow VB_{ZnO}$	422 nm (2.93 eV)	425 nm (2.92 eV)
$LUMO_{GO} \rightarrow VB_{ZnO}$	440 nm (2.82 eV)	465 nm (2.67 eV)
$ZnO(V_O) \rightarrow VB_{ZnO}$	X.	517 nm (2.39 eV)
$CB_{CdTe} \rightarrow VB_{CdTe}$	624 nm (1.98 eV)	620 nm (2.00 eV)

Table S3. Performance parameters obtained from CdTe/ZnO/GO based WQDLED.

V_{on} (V)	Max. EQE (%)	Max. Luminance (Cd/m ²)	CIE index (x,y)
8	0.08	480	(0.35, 0.28)

(V_{on} is the applied voltage when the luminance is detected with PR 670)