

Electronic Supplementary Material (ESI) for Nanoscale.
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Supporting Information

Seed-mediated and double shell strategy to realize large-size ZnSe/ZnS/ZnS quantum dots for high color purity blue light-emitting diodes

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SUPPORTING TABLE

Table S1. Comparison of our work with some typical Cd-free blue QDs and QLEDs reported in literature.

QDs	PL			EL						Refs
	λ_{max} (nm)	FWHM (nm)	QY (%)	λ_{max} (nm)	FWHM (nm)	Peak EQE(%)	Max.L (cd m ⁻²)	CIE coordinates	T ₅₀ @ 100 cd m ⁻²	
ZnSe/ZnS/ZnS	444	14	53	446	16	2.62	106	(0.16, 0.02)	3	This work
ZnSe/ZnS	420	16	40	425	/	0.65	/	/	/	1
ZnSe/ZnS	439	11	60	441	15.2	/	1170	(0.16, 0.15)	/	2
ZnSe/ZnS	435	16	40	435	/	/	25	/	/	3
ZnSe/ZnS	425	16	83	429	20.4	7.83	2632	(0.169, 0.023)	/	4
ZnSe/ZnS	425	/	80	429	21	7.4	2856	/	/	5
ZnSe/ZnS	445	<15	64	445	15	10.7	/	(0.156, 0.02)	<10	6
ZnSe/ZnS	433	22	55	434	16	6.88	450	(0.166, 0.013)	/	7
ZnSe/ZnSe _x S _{1-x} /ZnS	444	23.3	77.2	452	/	5.32	3754	(0.155, 0.025)	1.27	8
InP/ZnS	477	44	76	488	45	/	90	(0.13, 0.22)	/	9
InP/GaP/ZnS/ZnS	478	45	81	488	50	1.01	3120	(0.17, 0.24)	2	10
InP/ZnS/ZnS	468	47	45	485	/	1.7	140	/	0.067	11
ZnSeTe/ZnSe/ZnS	441	32	70	445	/	4.2	1195	(0.15, 0.049)	0.24	12
ZnSe:Te/ZnSeS/ZnS	450	41	32	455	40	0.33	261	/	/	13
ZnSeTe/ZnSe/ ZnSeS/ZnS	445	27	84	447	28	9.5	2904	(0.148, 0.048)	/	14
ZnTeSe/ZnSe/ZnS	457	36	100	460	35	20.2	88900	/	15850	15

PL, photoluminescence; EL, electroluminescence; FWHM, full widths at half maximum; QY, quantum yield; EQE, external quantum efficiency.

SUPPORTING FIGURES

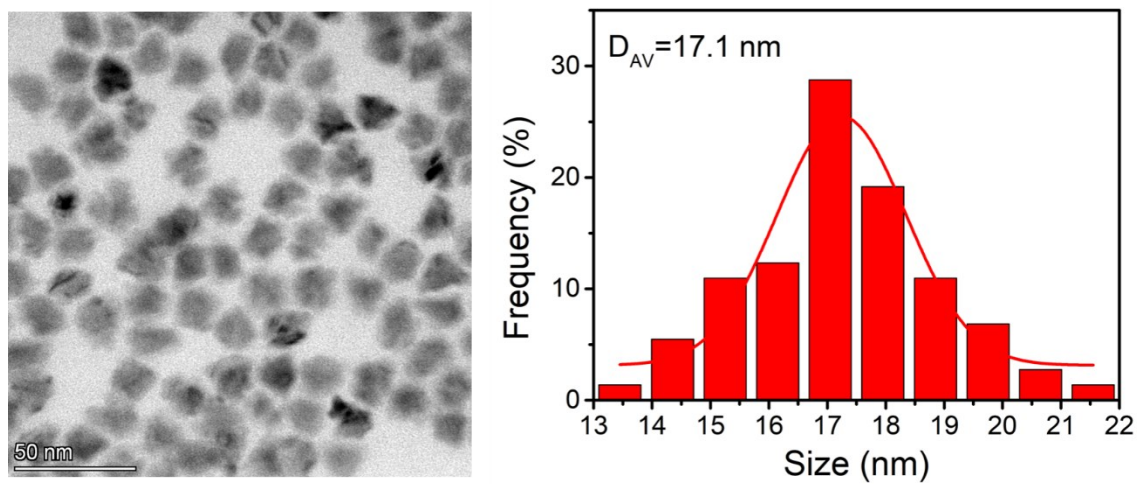


Figure S1. HTEM image and size distribution of ZnSe/ZnS/ZnS QDs.

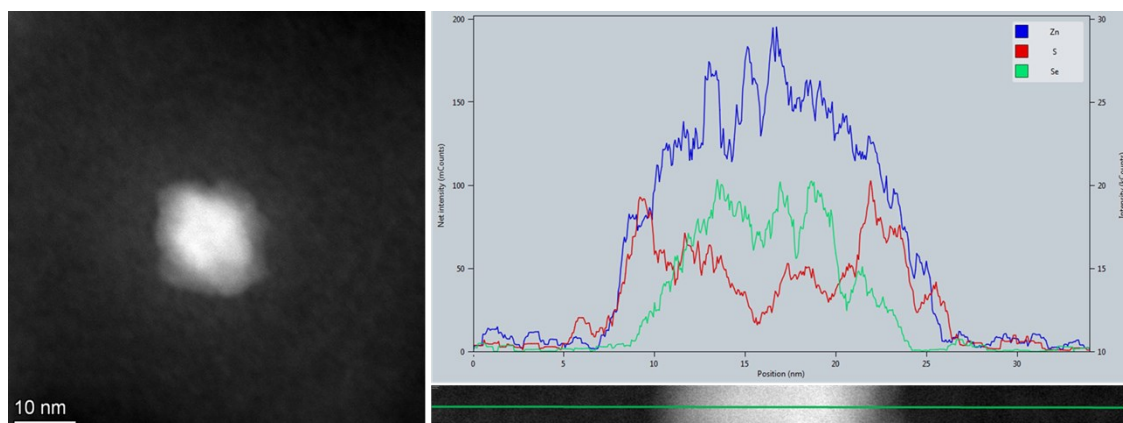


Figure S2. Elemental profiles of Zn, Se, and S from a typical ZnSe/ZnS/ZnS QD.

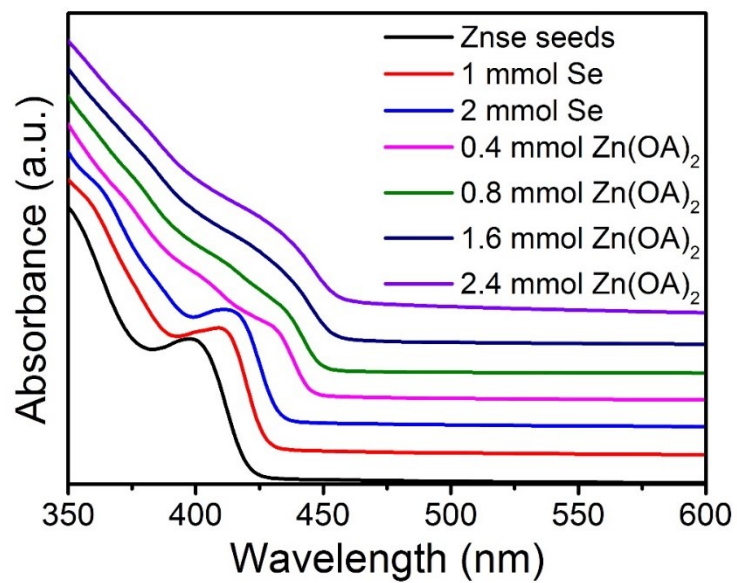


Figure S3. Absorption spectra evolution from ZnSe seeds to ZnSe cores.

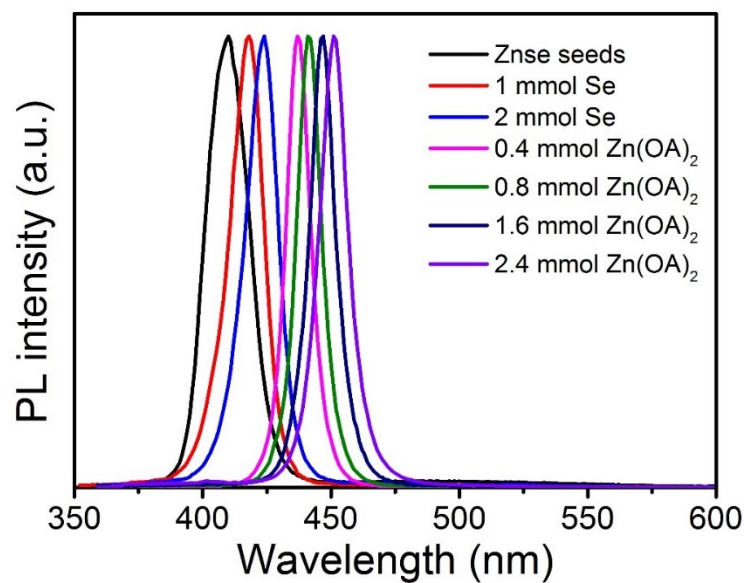


Figure S4. Photoluminescence spectra evolution from ZnSe seeds to ZnSe cores.

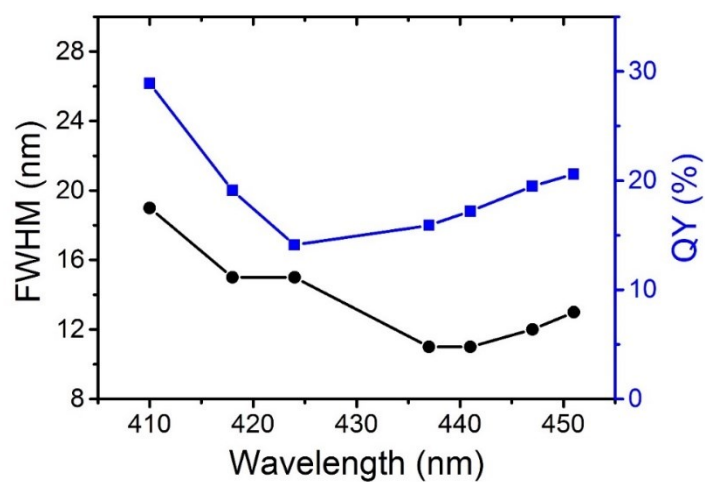


Figure S5. FWHM and PLQY variation from ZnSe seeds to ZnSe cores.

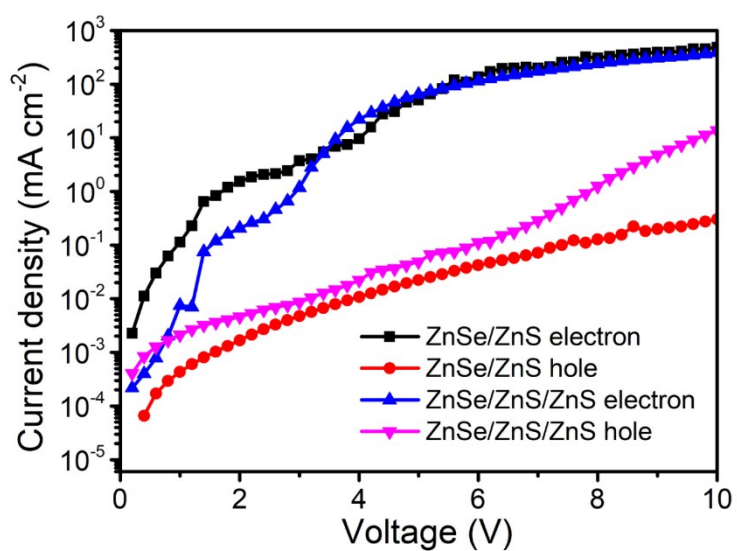


Figure S6. Current density-voltage characteristics of the electron-only and hole-only dominant devices.

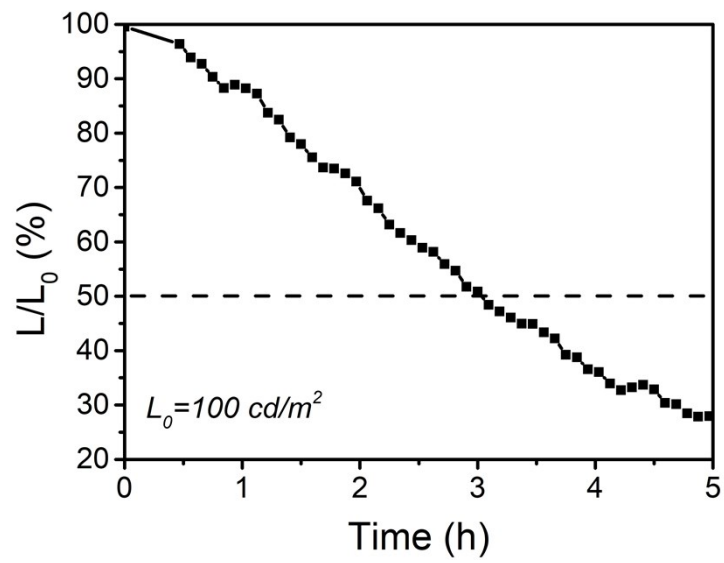


Figure S7. Operational lifetime characteristics of ZnSe/ZnS/ZnS QD-based QLEDs under an initial luminance of 100 cd m^{-2} .

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