

Cu-Cd-Zn-S/ZnS Core/Shell Quantum Dot/Polyvinyl Alcohol Flexible Films for White Light-Emitting Diodes

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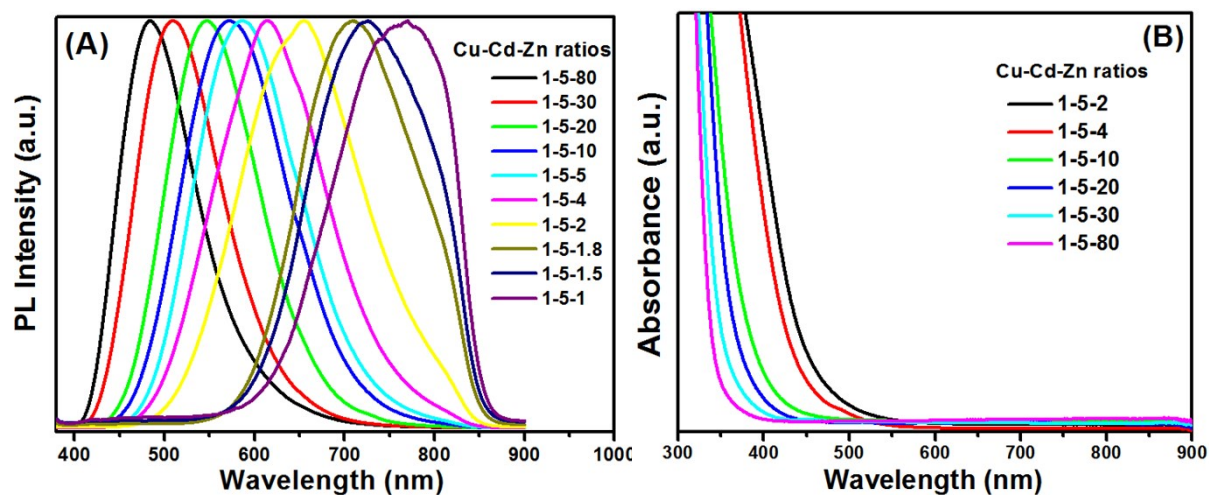


Figure S1. PL spectra and UV-vis absorption of Cu-Cd-ZnS QDs synthesized under different Zn content.

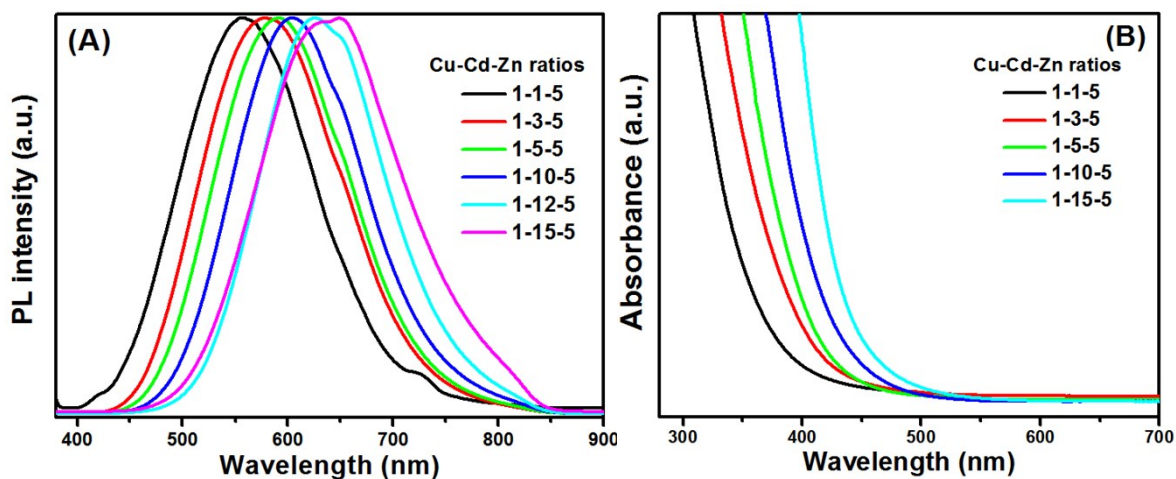


Figure S2. PL spectra and UV-vis absorption of Cu-Cd-ZnS QDs synthesized under different Cd content.

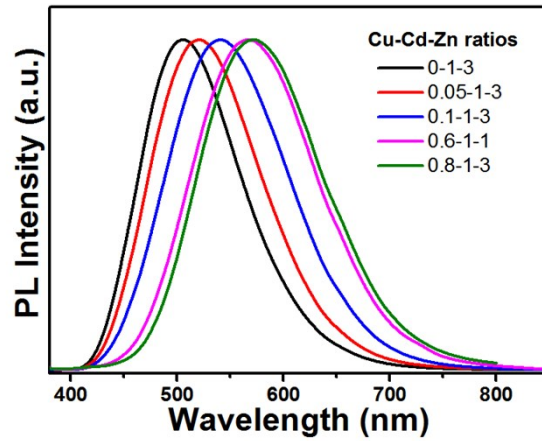


Figure S3. PL spectra of Cu-Cd-ZnS QDs synthesized under different Cu content.

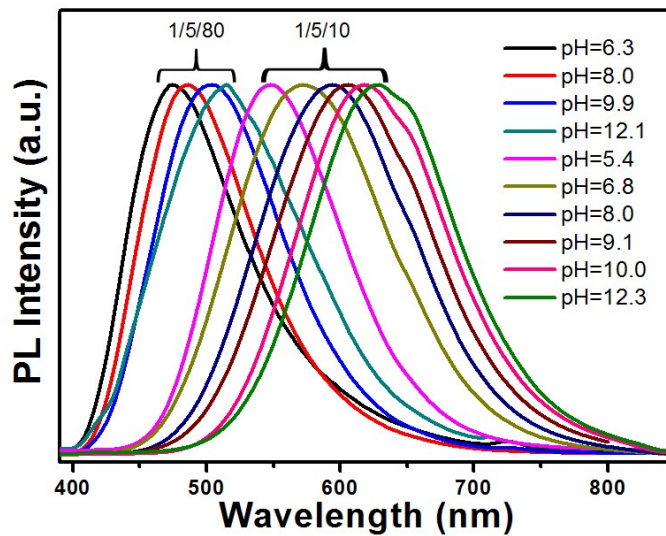


Figure S4. PL emission spectra of Cu-Cd-Zn-S QDs with the Cu/Cd/Zn ratios of 1:5:10 and 1:5:80 as well as different pH values.

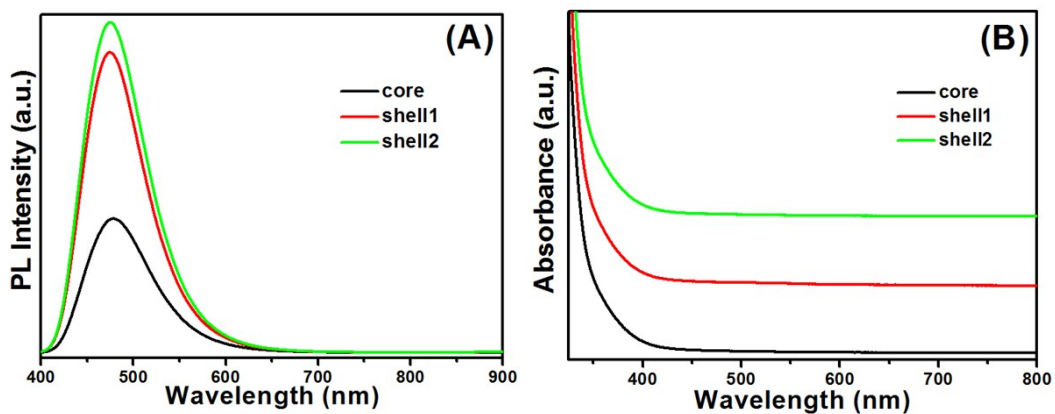


Figure S5. PL spectra (A) and UV-vis absorption spectra (B) of Cu-Cd-Zn-S/ZnS core/shell QDs with the deposition of different thickness ZnS shell around the core QDs.

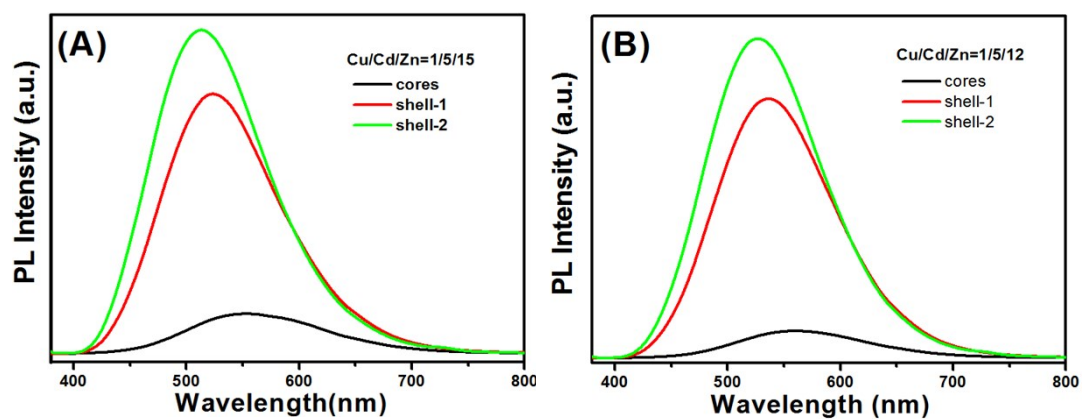


Figure S6. PL emission spectra of Cu-Cd-Zn-S/ZnS core/shell QDs with the deposition of different thickness ZnS shell around the core QDs.

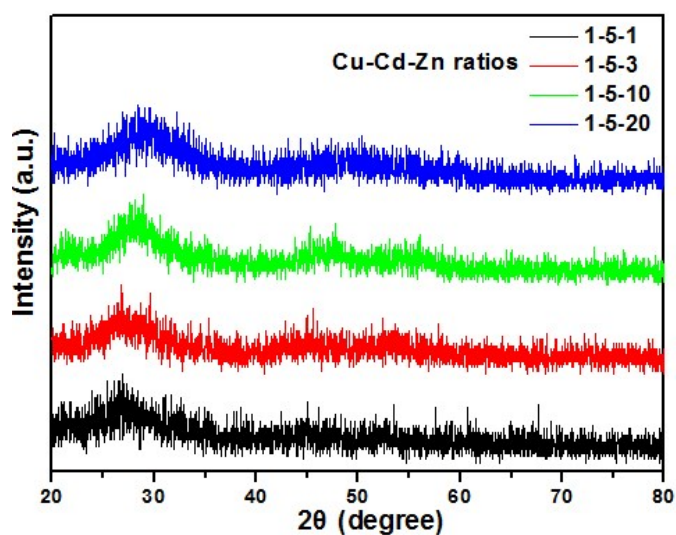


Figure S7. XRD patterns of Cu-Cd-Zn-S QDs with different Cu/Cd/Zn ratios.

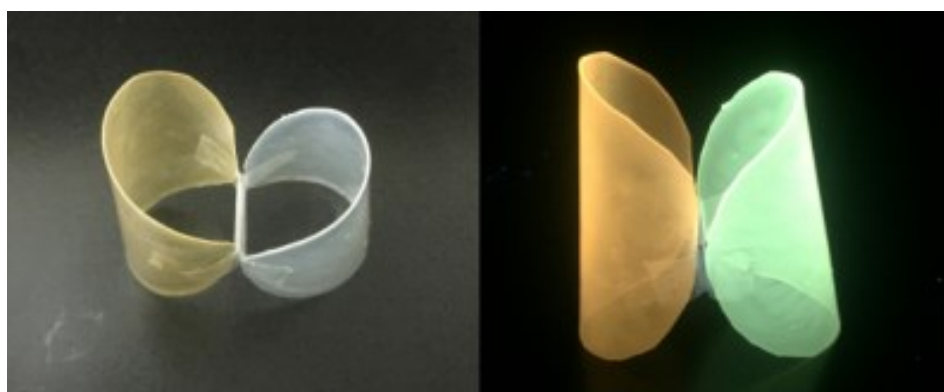


Figure S8. The photographs of flexible hybrid QD/PVA films bent under sunlight (left) and UV irradiation (right).

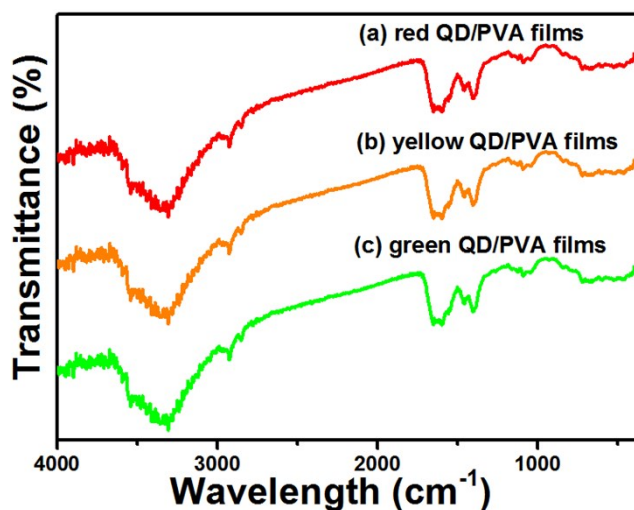


Figure S9. FT-IR spectra of (a) red (b) yellow (c) green QD/PVA flexible films.

Table S1. Double-exponential fitting results for PL decay profiles of Cu-Cd-Zn-S and Cu-Cd-Zn-S/ZnS core/shell QDs with Cu/Cd/Zn ratio of 1/5/10.

QDs	A ₁	τ ₁	A ₂	τ ₂	Lifetime (ns)
core	1974.2	56.2	521.1	784.9	629.5
shell	969.4	87.1	529.0	904.8	782.1

Table S2. EDS results (atomic percent) of Cu-Cd-Zn-S core QDs with different Cu/Cd/Zn ratios.

Cu/Cd/Zn ratios	Cu%	Cd%	Zn%	S%
1/5/1	7.0	34.3	8.4	50.3
1/5/1.8	6.5	32.5	11.6	49.5
1/5/3	5.8	28.2	17.1	48.9
1/5/5	4.2	22.7	20.5	52.7
1/5/10	2.9	15.3	28.1	53.6
1/5/15	2.2	11.2	37.9	48.6
1/5/20	1.9	12.1	38.1	47.9
1/5/30	1.5	7.5	39.2	51.7
1/5/80	0.7	3.3	45.4	50.6