

Electronic Supplementary Information

Physical Insights into Facilitation of an Unprecedented Complexation Reaction on the Surface of a Doped Quantum Dot Leading to White Light Generation

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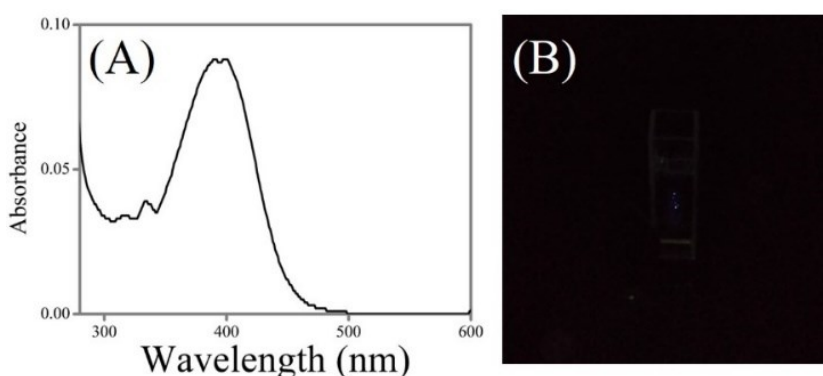


Fig. S1. (A) UV-vis (B) digital photograph (captured under 320 nm light from a spectrofluorimeter) of CuQ₂.

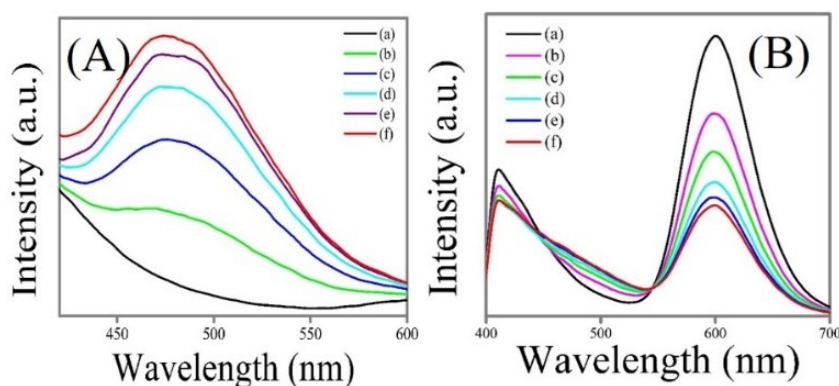


Fig. S2. Emission spectra of different amount (a) 0.0, (b) 2.0, (c) 4.0, (d) 6.0, (e) 8.0, and (f) 10.0 μL of 0.1 mM CuQ₂ treated Mn²⁺-doped ZnS QDs at an excitation wavelength of (A) 365 nm and (B) 320 nm.

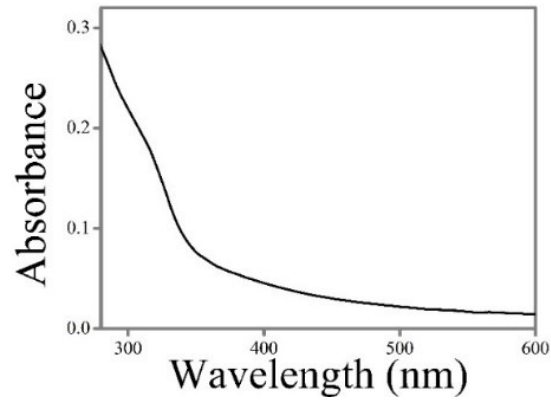


Fig. S3. UV-vis spectrum of CuQ₂ treated Mn²⁺-doped ZnS QDs (QDC).

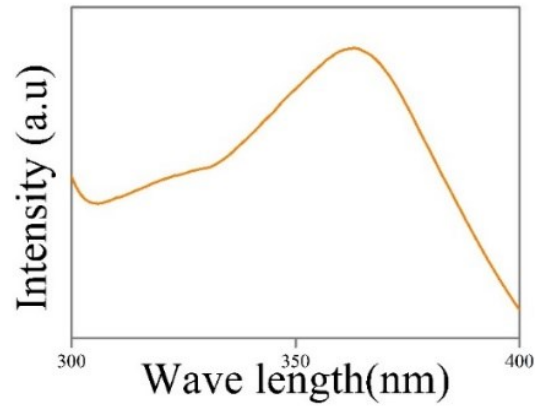


Fig. S4. Excitation spectrum (at λ_{em} -598 nm) of CuQ₂ treated Mn²⁺-doped ZnS QDs (QDC).

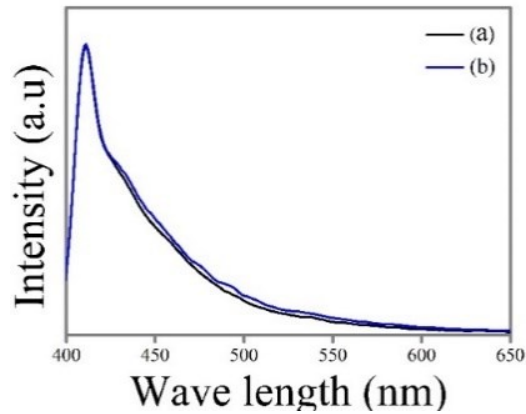


Fig. S5. Emission spectra (λ_{ex} =365 nm) of CuQ₂ (a) before and (b) after addition of Zn²⁺ ions.

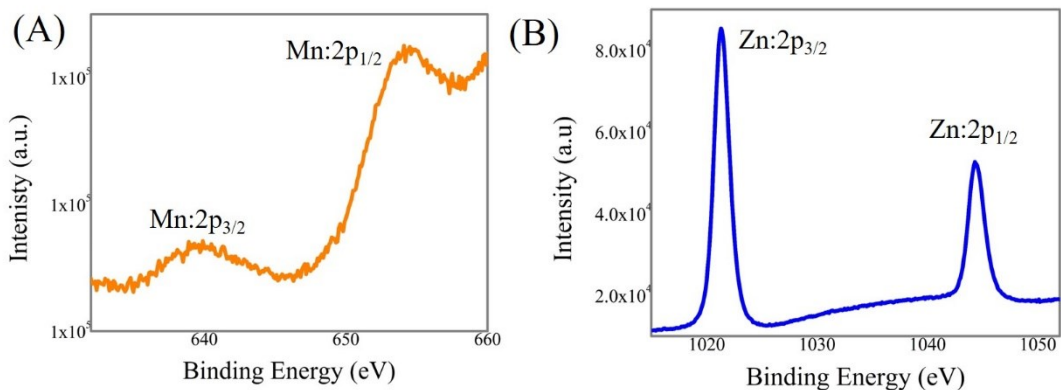


Fig. S6. X-ray photoelectron spectra (A) Mn-2p and (B) Zn-2p of CuQ₂ treated Mn²⁺-doped ZnS QDs (QDC).

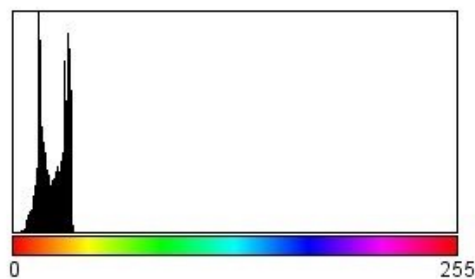


Fig. S7. Hue histogram of orange light emitting Mn²⁺-doped ZnS QDs. The hue value calculated by analysing Fig. 1F (manuscript) using Image-J software.

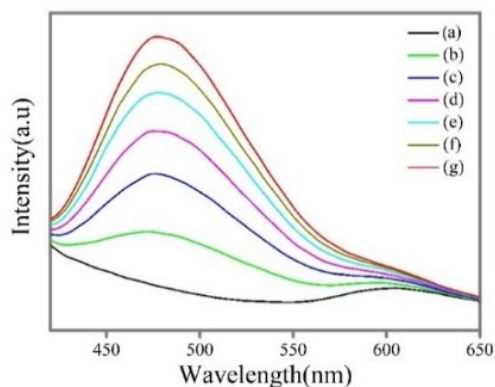


Fig. S8. Emission spectra ($\lambda_{\text{ex}} = 365 \text{ nm}$) of different amounts (a) 0.0, (b) 2.0, (c) 4.0, (d) 6.0, (e) 8.0, (f) 10.0, and (g) 12.0 μ L of 0.1 mM HQ added Mn²⁺ doped ZnS QDs.

Table S1. Chromaticities, CRI and CCT values of white light emitting CuQ₂ treated Mn²⁺-doped ZnS QDs (QDC) at different excitation wavelengths in the range of 320-365 nm (with respect to Fig. 2A-2B-2C).

λ_{ex} (nm)	CIE (x,y)	CRI	CCT (K)
320	0.53, 0.43	35	2019
325	0.52, 0.42	36	2060
330	0.51, 0.42	40	2136
335	0.50, 0.42	47	2284
340	0.47, 0.42	57	2618
345	0.43, 0.42	68	3252
350	0.38, 0.42	73	4191
355	0.34, 0.42	71	5146
360	0.32, 0.43	67	5854
365	0.30, 0.42	64	6322

Table S2. Chromaticities, CRI and CCT values of white light emitting CuQ₂ treated Mn²⁺-doped ZnS QDs (QDC) at different time interval and at an excitation wavelength of 355 nm (with respect to Fig. 2G-2H).

Time	CIE (x,y)	CRI	CCT (K)
0 sec	0.45, 0.44	36	3020
15 sec	0.44, 0.38	65	2638
59 sec	0.43, 0.38	71	2973
1 min 43 sec	0.42, 0.38	72	3025
2 min 27 sec	0.41, 0.38	75	3257
3 min 12 sec	0.40, 0.38	78	3539
3 min 57 sec	0.39, 0.39	80	3877
4 min 42 sec	0.38, 0.39	80	4140
5 min 26 sec	0.37, 0.40	80	4405
6 min 12 sec	0.36, 0.40	79	4609
6 min 56 sec	0.35, 0.40	78	4753
7 min 41 sec	0.35, 0.41	77	4860
8 min 25 sec	0.35, 0.41	76	4930
9 min 10 sec	0.35, 0.41	76	4998
9 min 55 sec	0.34, 0.41	76	5045
10 min 39 sec	0.34, 0.41	75	5069
11 min 24 sec	0.34, 0.41	75	5088
12 min	0.34, 0.41	75	5087
12 min 54 sec	0.34, 0.42	75	5090