Electronic Supplementary Material (ESI) for Nanoscale.

Poly(vinylpyrrolidone) Supported Copper Nanoclusters: Glutathione Enhanced Blue Photoluminescence for Application in Phosphor Converted Light Emitting Devices

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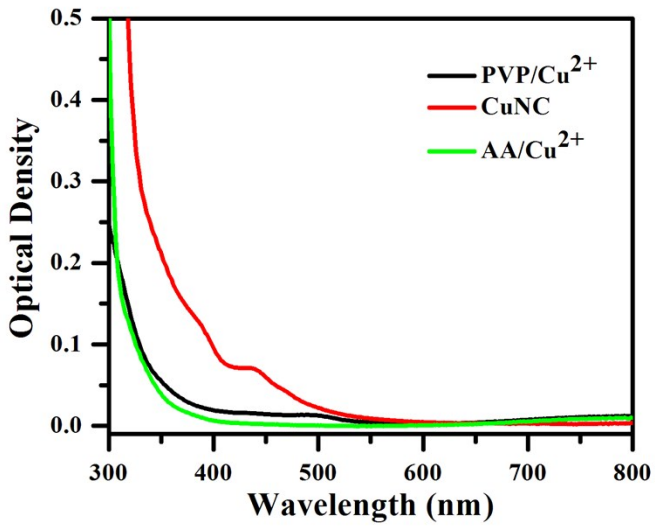

Figure S1. UV-Visible absorption spectra of Cu NCs and the mixtures of PVP/Cu^{2+} and AA/Cu^{2+}.

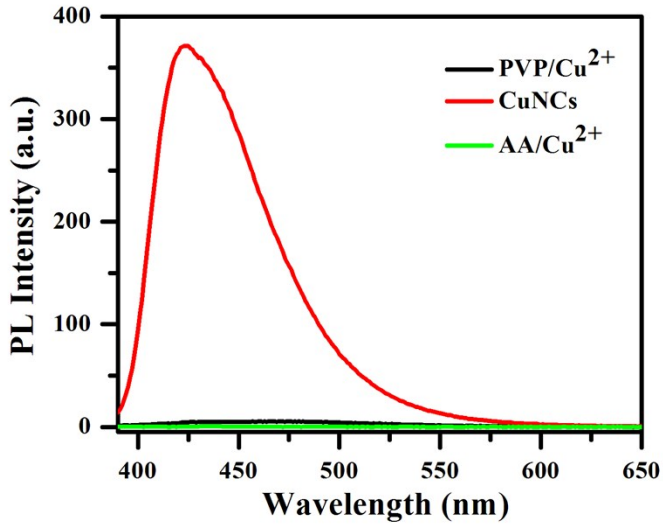

Figure S2. PL spectra of Cu NCs and the mixtures of PVP/Cu^{2+} and AA/Cu^{2+}.

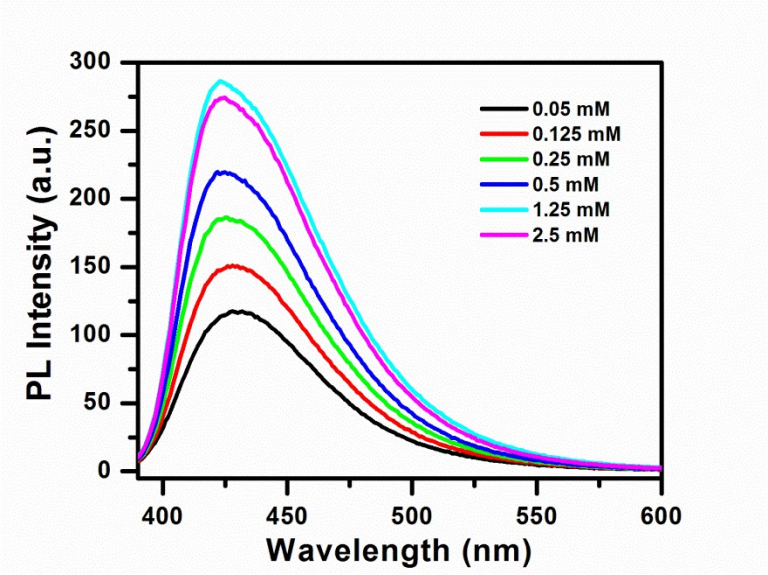

Figure S3. Relationship between PL intensity of as-prepared Cu NCs and the concentration of PVP.

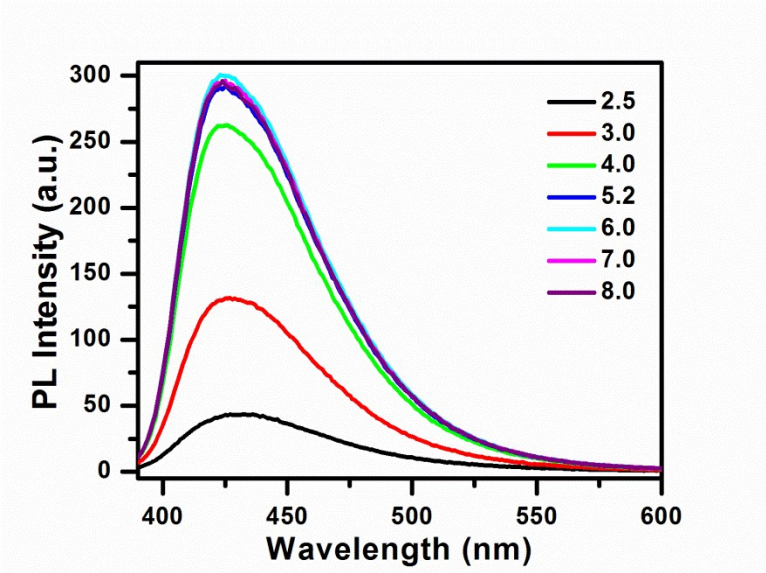

Figure S4. Relationship between PL intensity of as-prepared Cu NCs and pH of PVP solution.

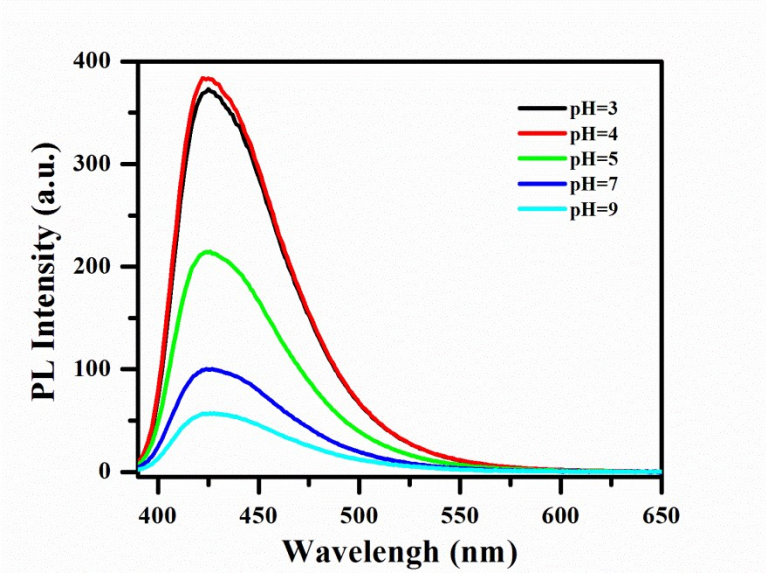

Figure S5. The effect of pH on the PL enhancement of as-prepared Cu NCs treated with GSH.

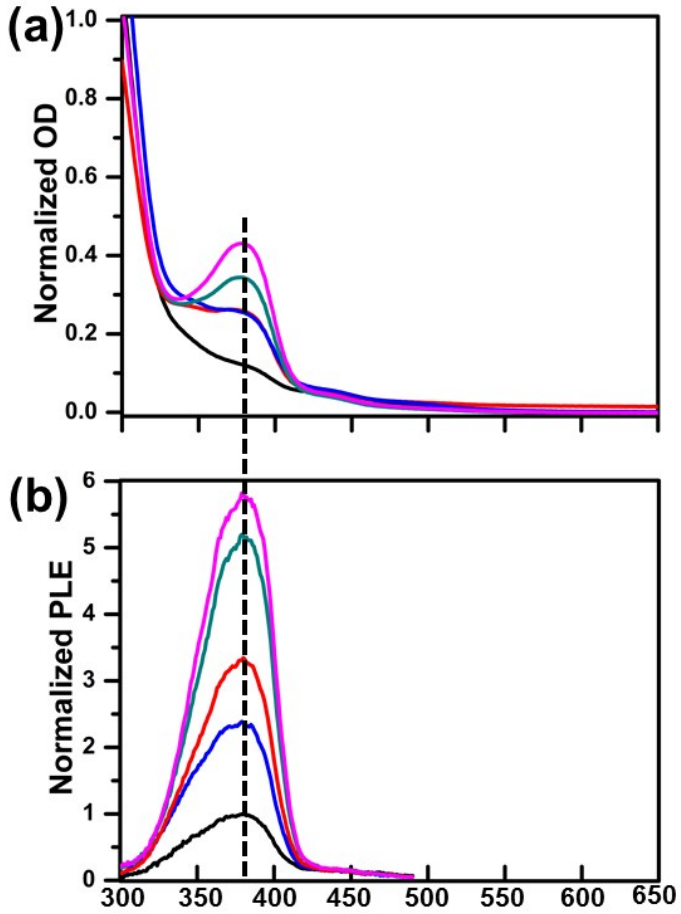

Figure S6. Absorption (a) and PLE (b) spectra of as-prepared Cu NCs (black) and those treated by different ligands (cysteine, cysteamine, ME and MPA from top to down), at the emission wavelength of 500 nm.

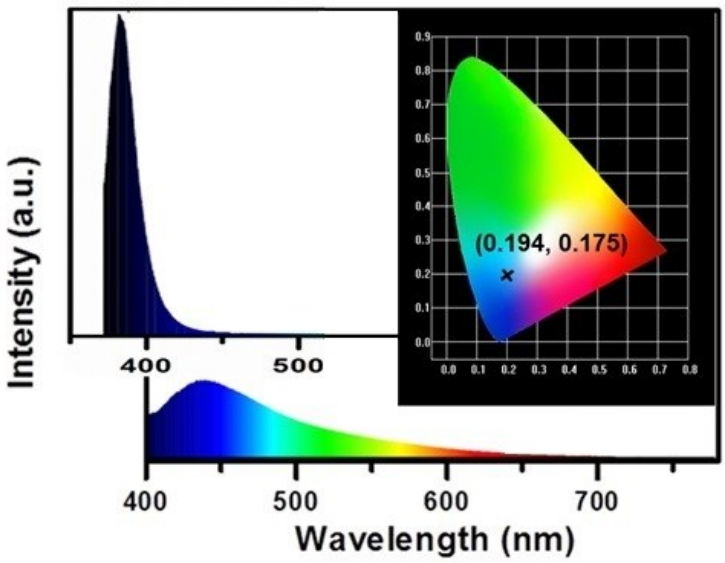

Figure S7. Emission spectrum of blue LED fabricated by using GSH treated Cu NCs shown alongside with emission spectrum of the GaN LEDs chip. CIE chromaticity coordinate of Cu NC based LED is shown on the right.

Table S1. Performance comparison of fabricated white LEDs with previously reported[1,2] metal NC-based white LEDs.

Reference	CIE(x, y)	CCT (K)	CRI	Luminous Efficiency (lmW^{-1})
1	(0.32, 0.36)	/	/	/
2	(0.31, 0.36)	6577	88	/
This work	(0.35, 0.33)	4742	92	10

References

1. Z. Wu, J. Liu, Y. Gao, H. Liu, T. Li, H. Zou, Z. Wang, K. Zhang, Y. Wang, H. Zhang and B. Yang, *J. Am. Chem. Soc.,* 2015, **137,** 12906.

2. J. Liu, Z. Wu, T. Li, D. Zhou, K. Zhang, Y. Sheng, J. Cui, H. Zhang and B. Yang, *Nanoscale,* 2016, **8,** 395.