

Supporting Information

Interesting photoluminescence behaviour in graphitic carbon nitride quantum dots attached PbCrO₄ colloidal nanostructures

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❖ Quantum Yield (QY) calculations:

We have calculated relative fluorescence quantum yield of as-synthesized graphitic carbon nitride quantum dots using following expression

$$\Phi_s = (I_s/I_r) \times (A_r/A_s) \times (\eta_s^2/\eta_r^2) \times \Phi_r$$

Where r and s refer to the reference and the sample respectively, Φ is the fluorescence quantum yield, I is the measured integrated fluorescence emission intensity, A is the optical density and η is the refractive index of the solvents. Here, we have use Quinine sulphate in 0.1M H₂SO₄ (Φ_r (QY) = 0.54 at 360 nm) as a standard.

So, as-synthesized CNQD gives 19.2 % QY.

❖ Detection limit calculation:

Lower detection limits of PbCrO₄ are calculated using the following expression, $3\sigma/b$, where σ is the standard deviation of blank and b is the slope of the calibration curve.

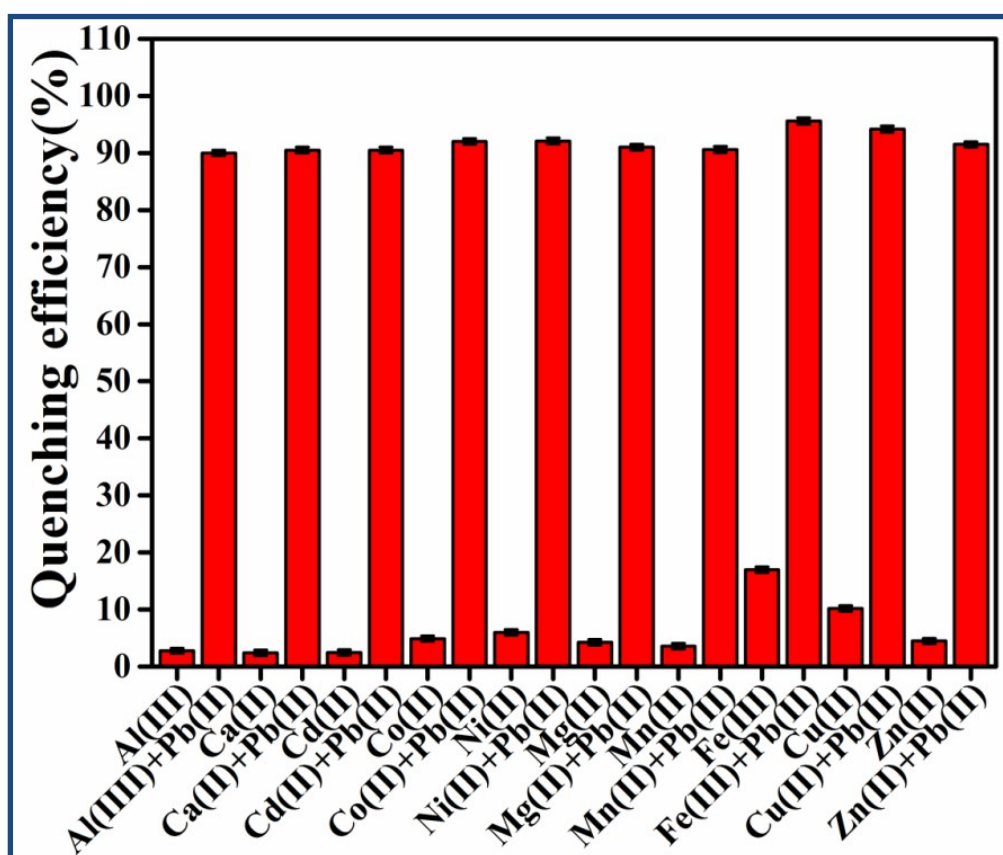


Figure S1 Selectivity of the formation of PbCrO₄ nano structures.

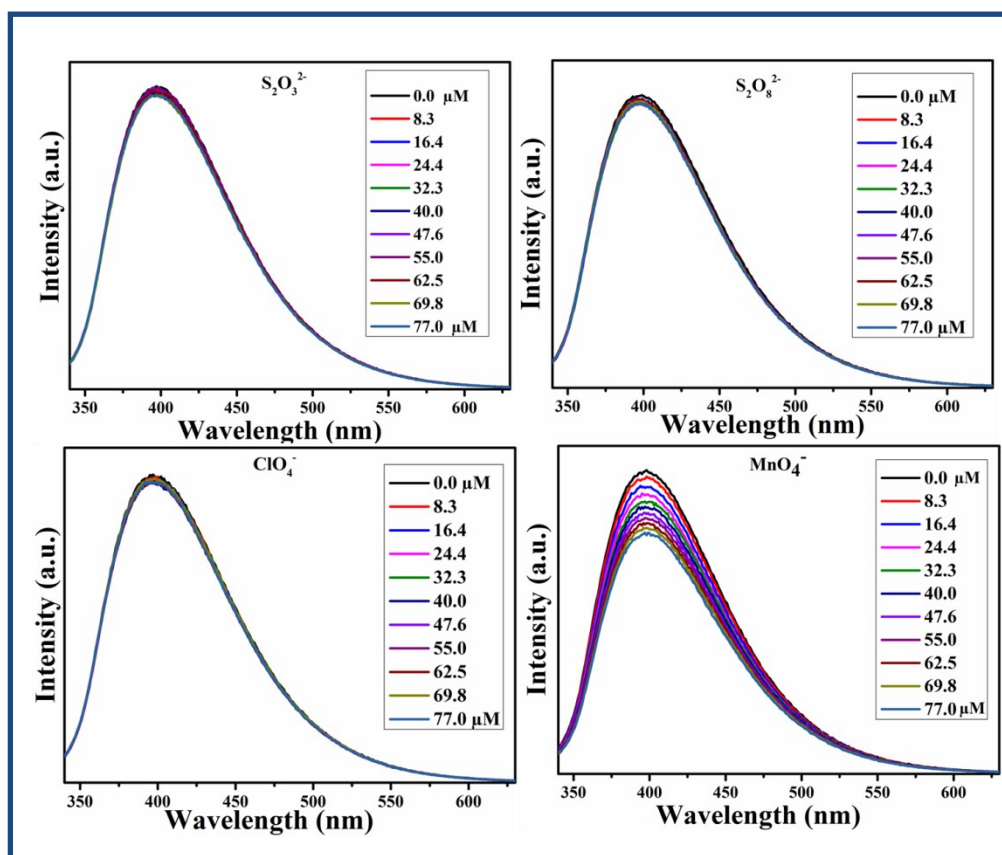


Figure S2 Photoluminescence spectra of CNQD at 320nm excitation after gradual addition of different ions ($S_2O_3^{2-}$, $S_2O_8^{2-}$, ClO_4^- , MnO_4^-)

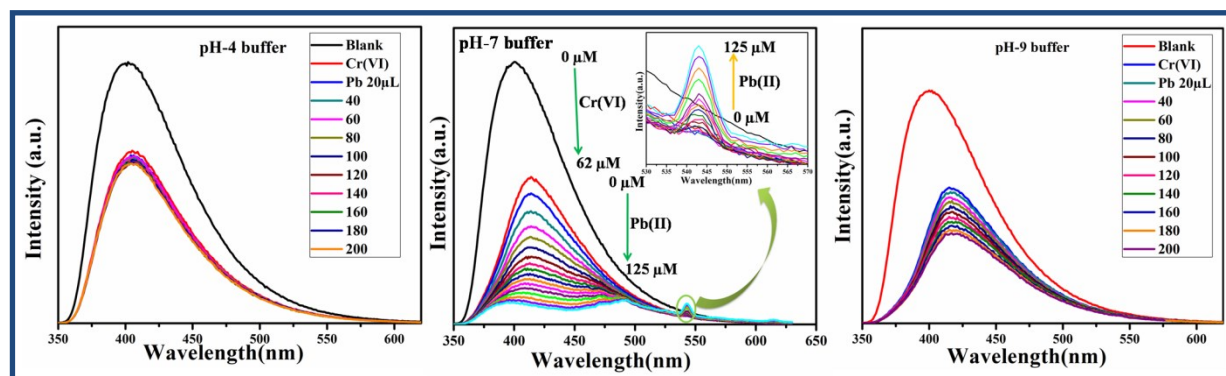


Figure S3: PL quenching spectra of CNQD at different pH medium after addition of Pb^{2+} ions.

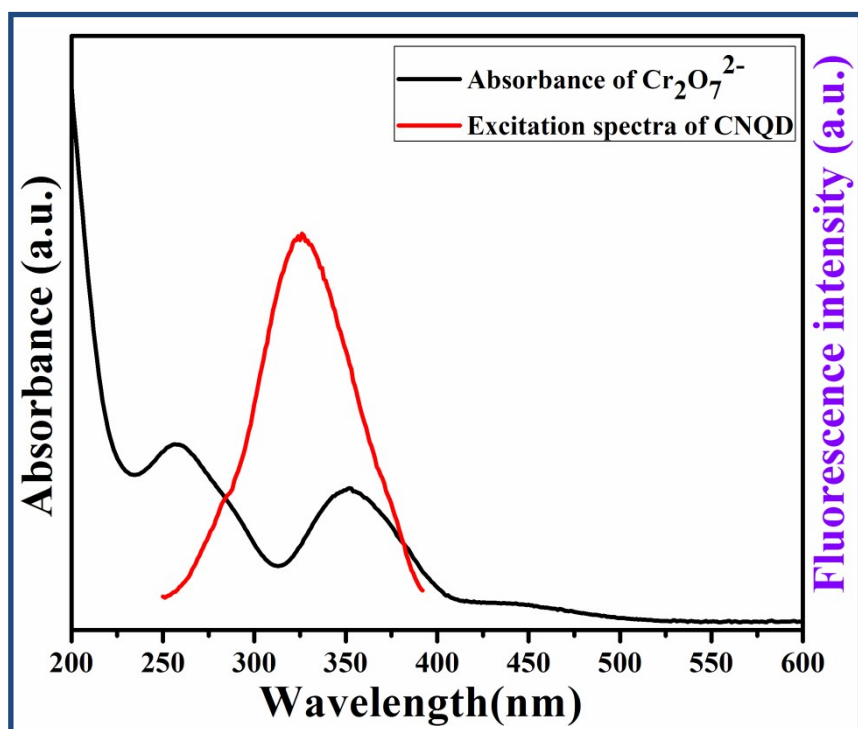


Figure S4 Spectral overlap between absorption spectra of $\text{Cr}_2\text{O}_7^{2-}$ and excitation spectra of CNQD.

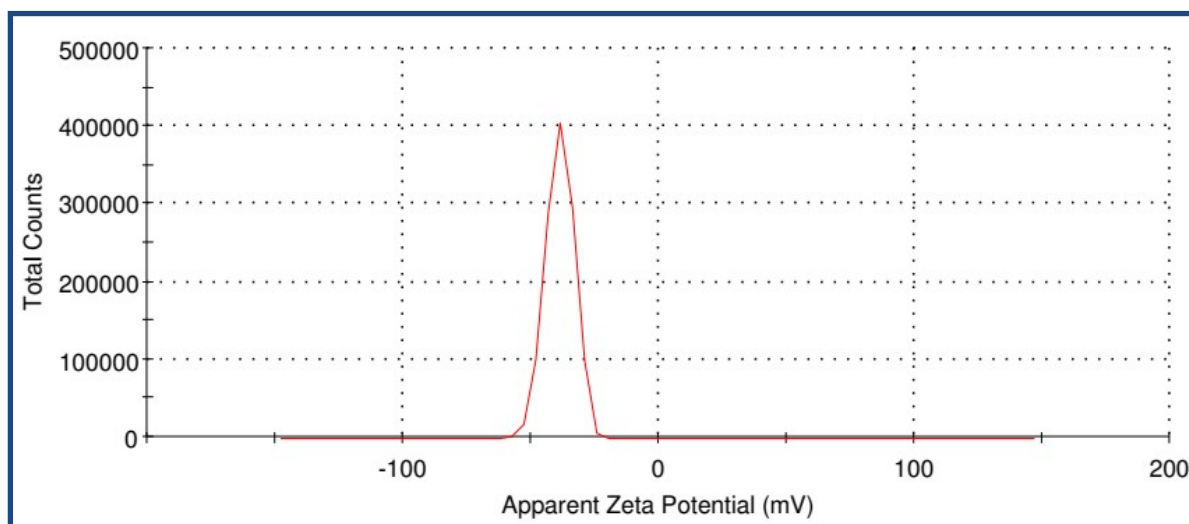


Figure S5 Zeta potential of CNQD after addition of $\text{Cr}_2\text{O}_7^{2-}$ ions.

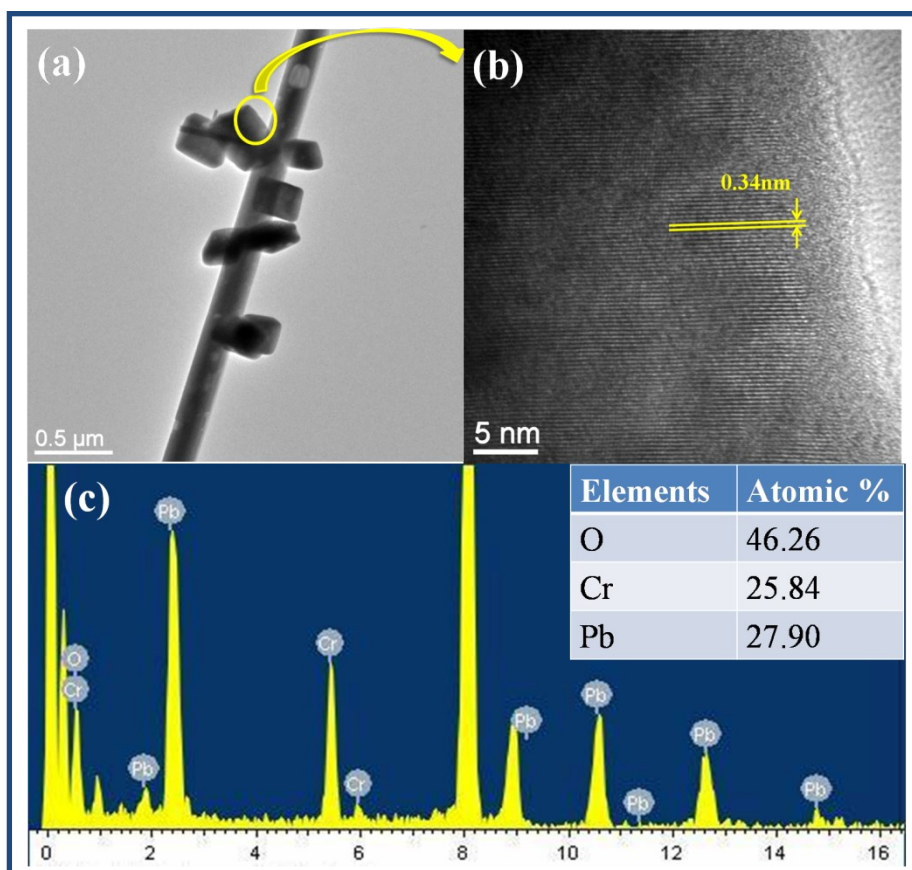


Figure S6 (a) TEM image of PbCrO_4 nanostructure; (b) HR-TEM image of PbCrO_4 nanostructure; (c) EDX spectra of PbCrO_4 nanostructure.

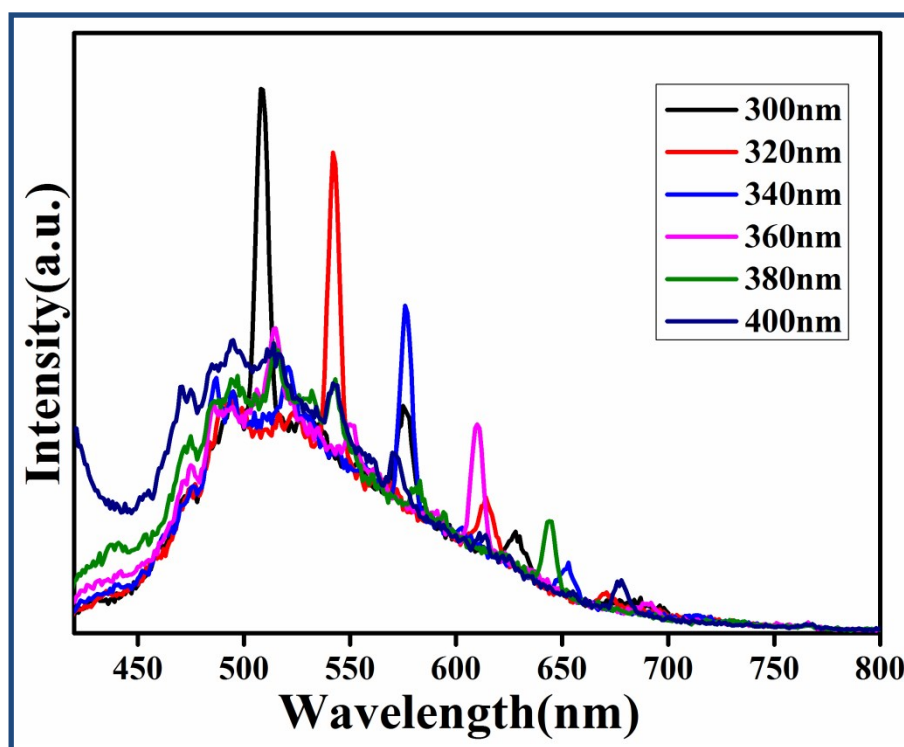


Figure S7 PL spectra of PbCrO_4 nano structure at different excitation wavelength.

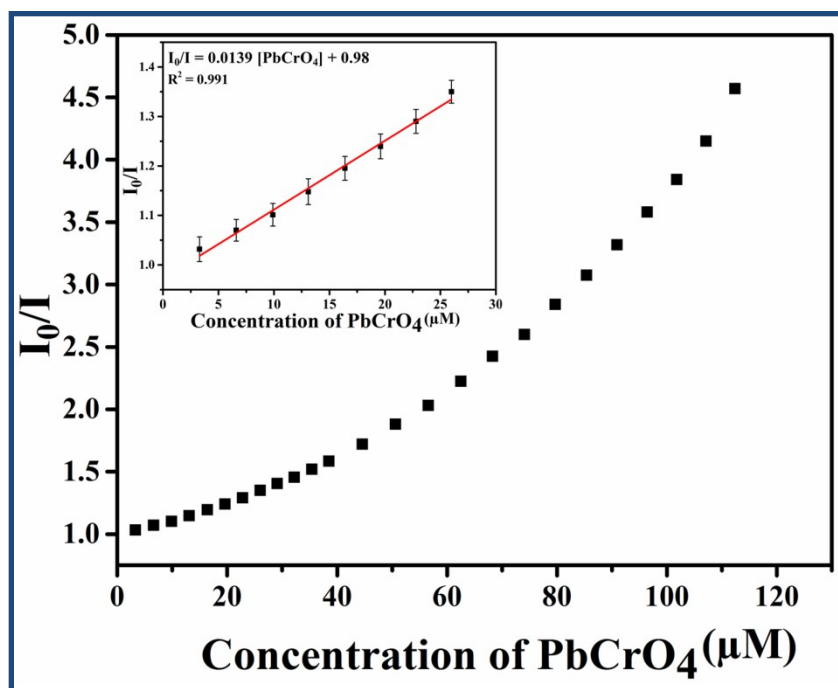


Figure S8 Nonlinear curve of Stern-Volmer plot for yellow PbCrO₄ pigment, inset shows the fitting curve of the linearity of Stern-Volmer plot for PbCrO₄ at lower concentration.

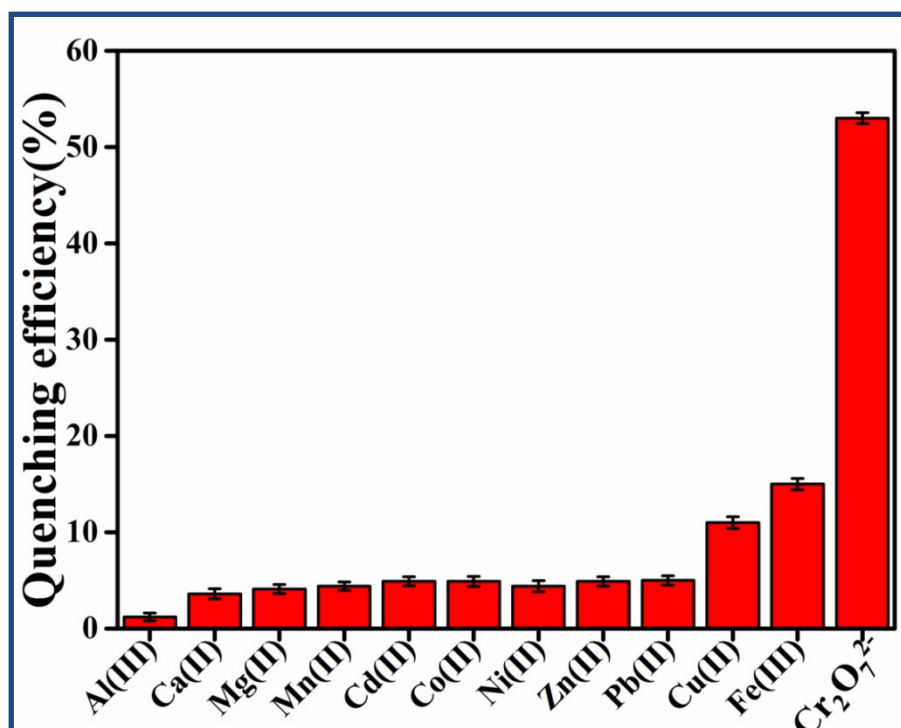


Figure S9 PL quenching efficiency of different metal ions in pure CNQD solutions.

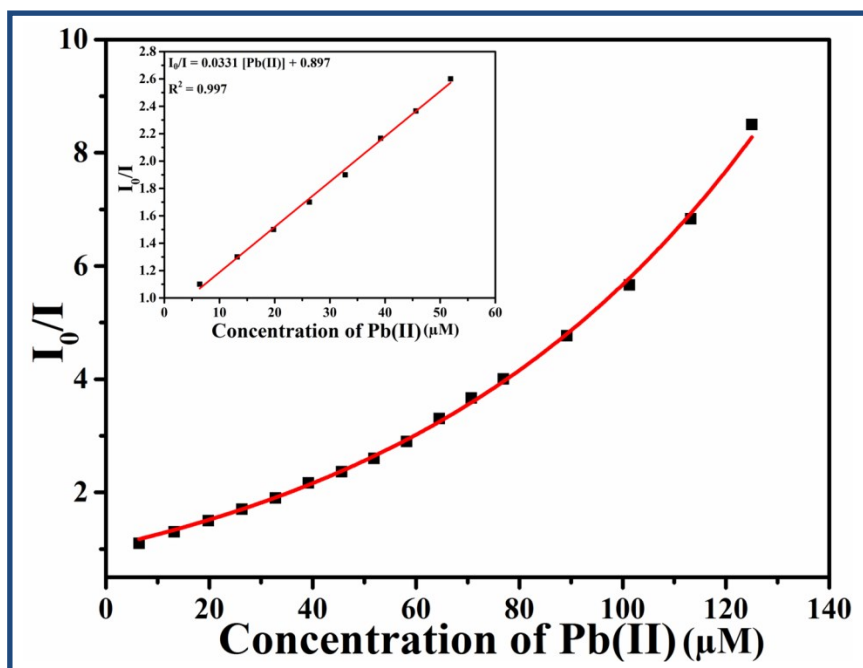


Figure S10 Fitting Nonlinear curve of Stern-Volmer plot during in-situ formation of colloidal PbCrO₄, inset shows the fitting curve of the linearity of Stern-Volmer plot for Pb(II) ions at lower concentration.

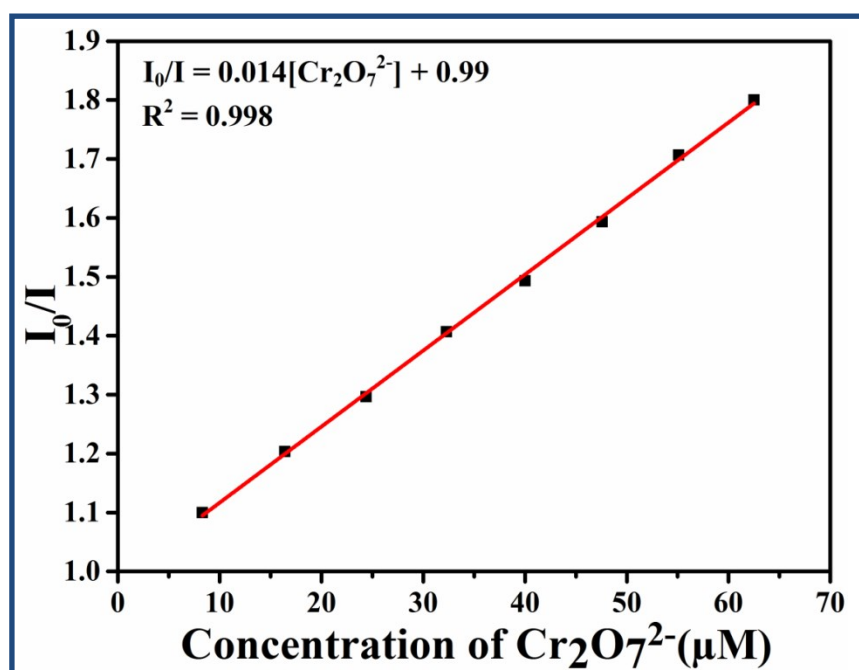


Figure S11 Fitting Curve of Stern-Volmer plot for $\text{Cr}_2\text{O}_7^{2-}$

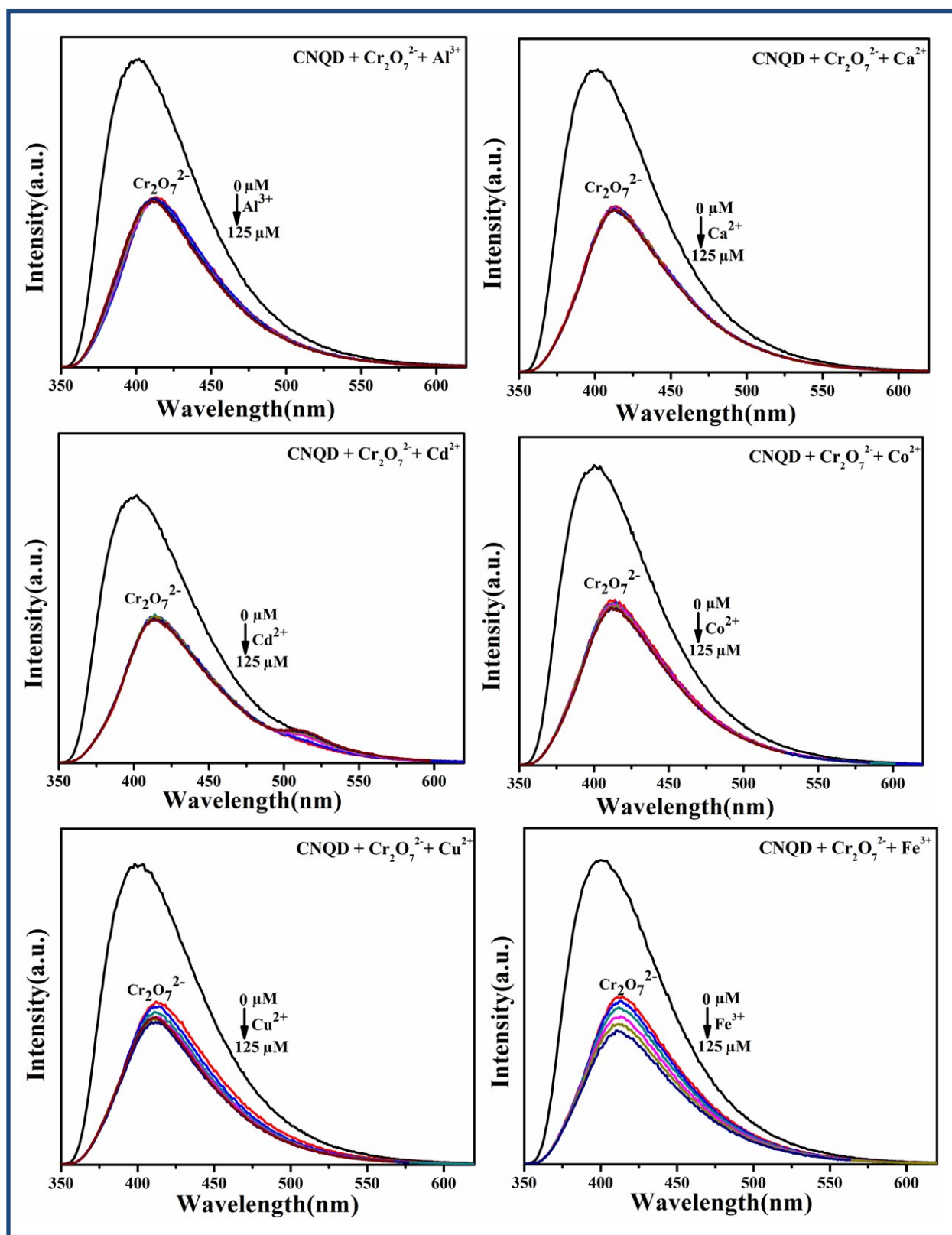
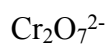


Figure S12 PL spectra of CNQD after gradual addition of different metal ions in presence of



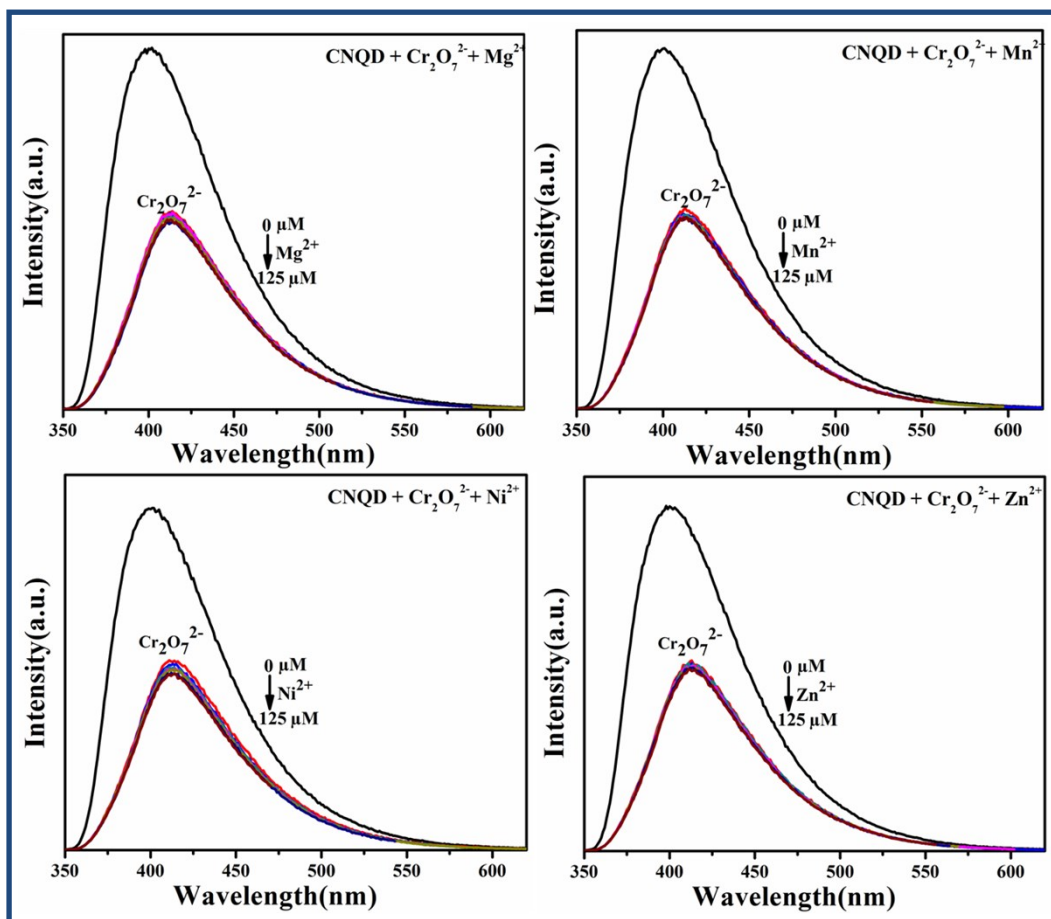


Figure S13 PL spectra of CNQD after gradual addition of different metal ions in presence of $\text{Cr}_2\text{O}_7^{2-}$