

Electronic Supplementary Information

Bright Persistent Green Emitting Water-Dispersible Zn₂GeO₄:Mn Nanorods

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S1. Quantum yield measurements of the water dispersed ZGOM NRs

The QY of the Zn₂GeO₄:Mn NRs was measured relative to fluorescein isothiocyanate (FITC, QY = 92% in 0.1 N NaOH(aq)) with excitation at 492 nm. Fluorescence spectra of the ZGOM NRs and the FITC dye were taken under identical spectrometer conditions in triplicate and averaged. Solutions were degassed with argon in cuvettes. The optical density was kept below 0.1 at the maximum excitation.

$$\Phi_X = \Phi_{ST} \left(\frac{\text{Grad}_X}{\text{Grad}_{ST}} \right) \left(\frac{\eta_X^2}{\eta_{ST}^2} \right)$$

where the subscripts ST and X denote standard and unknown samples, respectively; Φ is the fluorescence QY, Grad is the gradient from the plot of integrated fluorescence intensity versus absorbance, and η the refractive index of the solvent which is 1.33 for both standard FITC dye in 0.1 N NaOH and the unknown ZGOM NRs in water.

$$QY(\%) = 92.0 \times \frac{1.83188 \times 10^{-8}}{6.32717 \times 10^{-8}}$$

$$QY(\%) = 26.63 \%$$

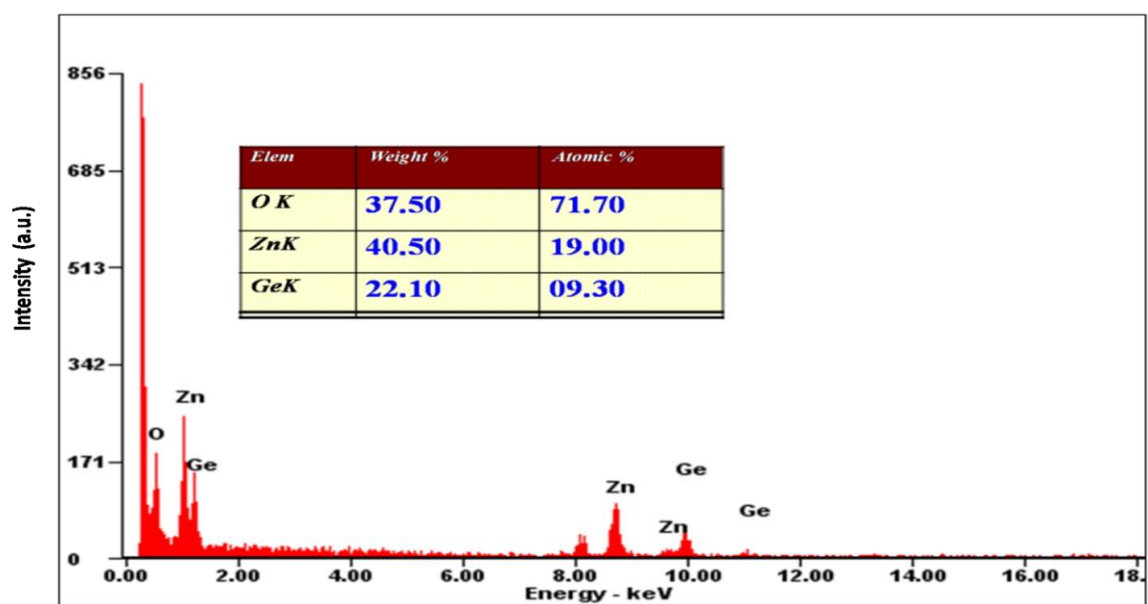


Figure S1. EDS spectrum of the Zn_2GeO_4 NRs with the inset showing the elemental Zn/Ge ratio.

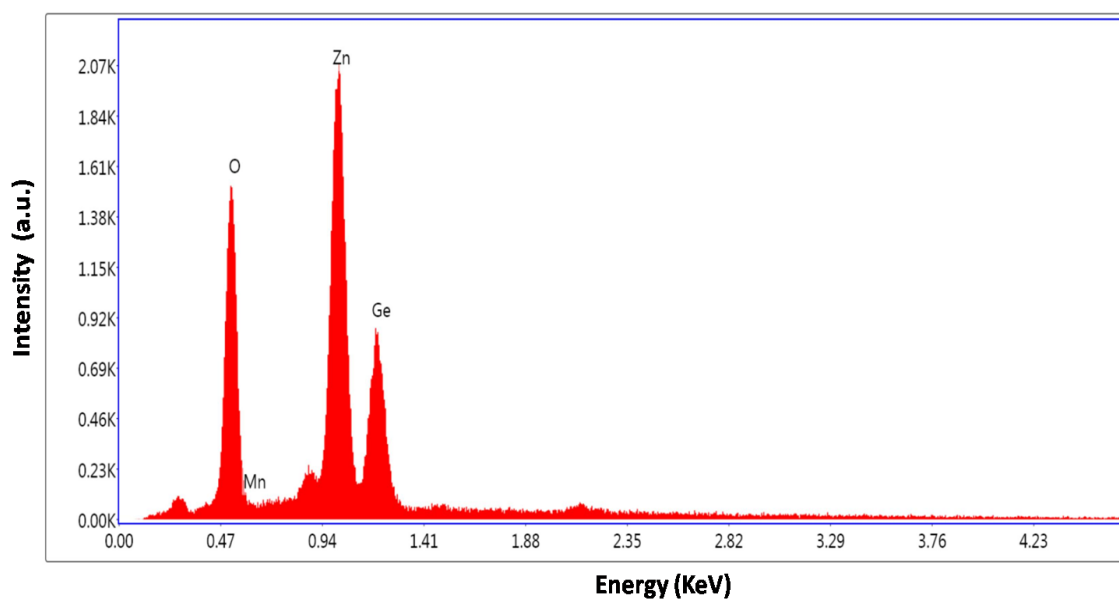


Figure S2. EDS spectrum of the $\text{Zn}_2\text{GeO}_4:\text{Mn}^{2+}$ NRs.

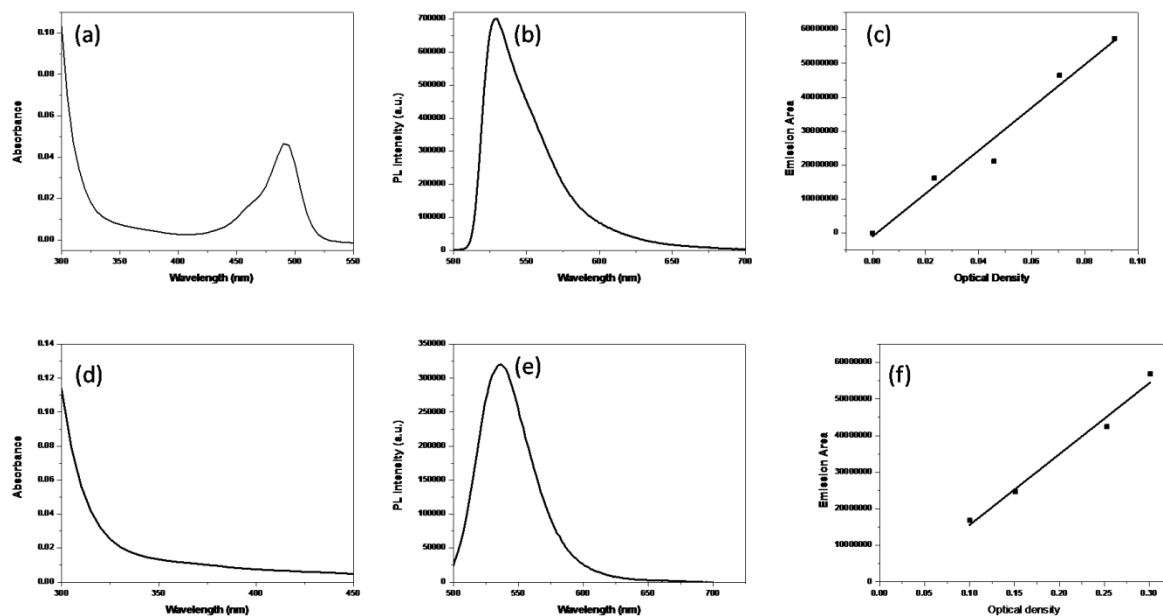


Figure S3. Top Panel: (a) UV-visible, (b) PL spectra, and (c) plot of optical density versus emission area using different concentrations of the FITC dye solution (0.1 N NaOH). Excitation wavelength used was 492 nm. Bottom Panel: (d) UV-visible, (e) PL spectra, and (f) plot of optical density versus emission area using different concentrations of the ZGOM NRs in water. Excitation wavelength used was 302 nm. PL Intensity is in arbitrary unit but the numbers are provided for comparison as both measurements of the FITC reference and the ZGOM NRs were carried out by the same fluorimeter.