Electronic Supplementary Information

Observation of Bright Green Luminescence in Eu^{2+} Complexed Graphene Oxide Composite through Reduction of Eu^{3+}

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Content

1. Experimental Characterization details:

The chemical structural analysis of the synthesized apGOc and Eu^{2+}apGOc were done utilizing Fourier transformed infrared spectrometer (FTIR, Shimadzhu). Raman spectroscopy was performed using (WITEC alpha, 300R) with 532 nm laser wavelength for assertion of the changes in the graphitic domain after the conjugation of the Eu^{2+} ion within apGOc. X-ray photoelectron spectroscopy was performed by monochromatic Al Kα (hν =1486.6 eV) X-ray source and a hemispherical analyzer (SPECS, HSA 3500) for confirmation of the presence of Eu^{2+} ion in the composite system. Furthermore, information about the morphology and bulk elemental EDX mapping were obtained using field emission scanning electron microscope (FESEM, S-4800, Hitachi). Finally photoluminescence measurement was performed by a Shimadzu RF5301 spectrofluorometer and FLS980 spectrometer to ascertain the photoemission characteristics of this synthesized material. Time decay analysis was carried out by picoseconds diode laser in IBH fluorocube apparatus JY-IBH-5000M and FLS980 instruments using nanosecond flash lamp.

2. Quantum yield calculation:

The PL quantum yield was calculated using the following equation through an analytical approach.

$$\Phi_f = \frac{\displaystyle\int_{\lambda_{em_1}}^{\lambda_{em_2}} \frac{[I_x(\lambda_{em}) - I_b(\lambda_{em})]}{s(\lambda_{em})}\lambda_{em} d\lambda_{em}}{\displaystyle\int_{\lambda_{ex} - \Delta\lambda}^{\lambda_{ex} + \Delta\lambda} \frac{[I_b(\lambda_{ex}) - I_x(\lambda_{ex})]}{s(\lambda_{ex})}\lambda_{ex} d\lambda_{ex}} = \frac{N_{em}}{N_{abs}}$$

Where, N_{em} is the total no of emitted photons which obtained upon integration of blank-corrected ($Ib(\lambda_{em})$) and spectrally corrected ($Ix(\lambda_{em})$) emission spectrum of the sample. N_{abs} is the number of absorbed photons which follows from the integrated difference between the excitation light resulting from measurements with the blank ($Ib(\lambda_{ex})$) and the sample ($Ix(\lambda_{ex})$). Using the above equation the calculated absolute PL quantum yields are found to be 14 % and 20 % for apGoc and Eu^{2+}apGOc, respectively.

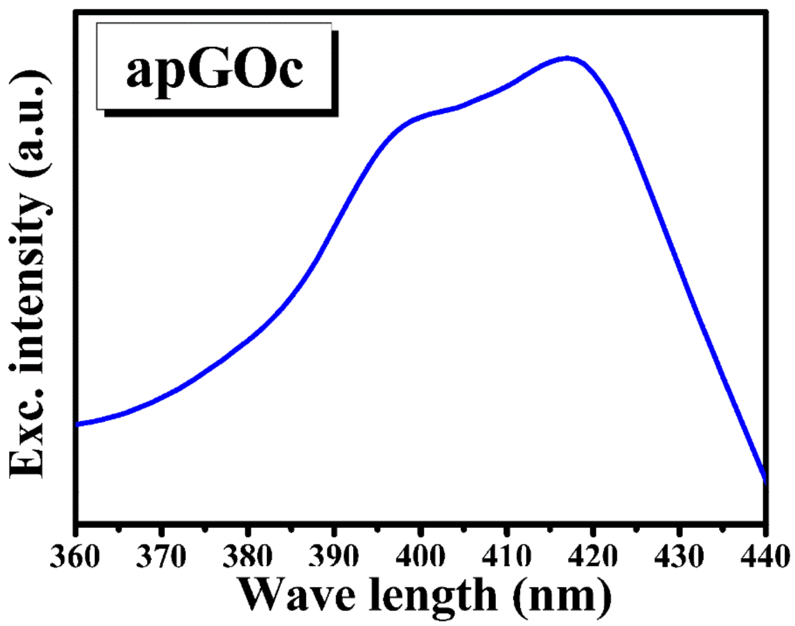

Figure S1: Excitation (Exc.) spectra of apGOc.

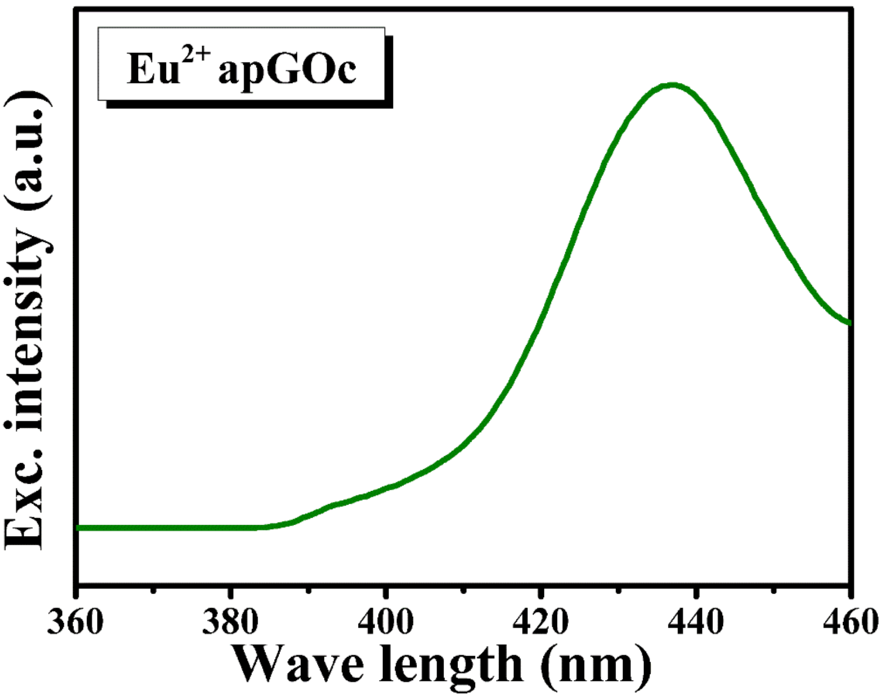

Figure S2: Excitation (Exc.) spectra of Eu^{2+}apGOc.

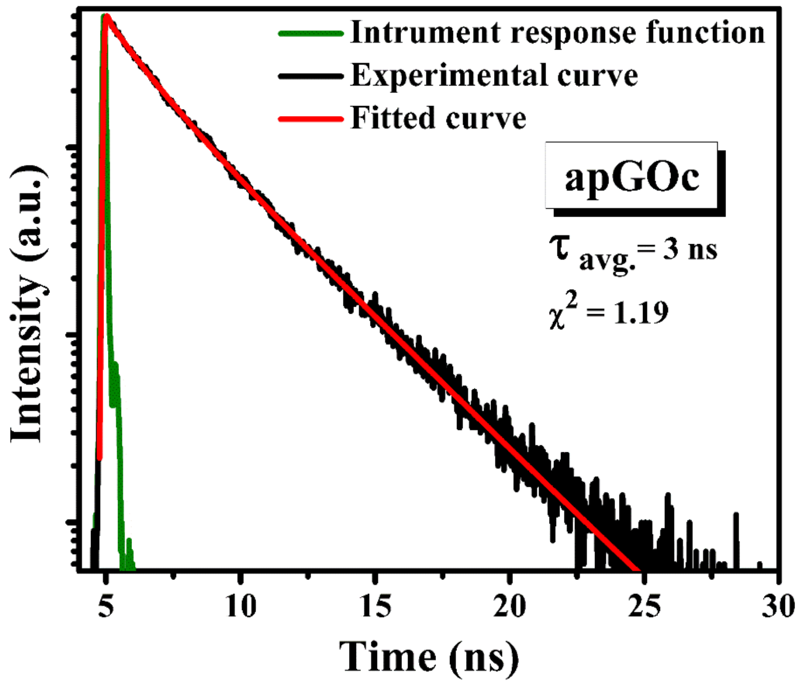

Figure S3: Photoluminescence decay curve of apGOc.