

## Supporting Information

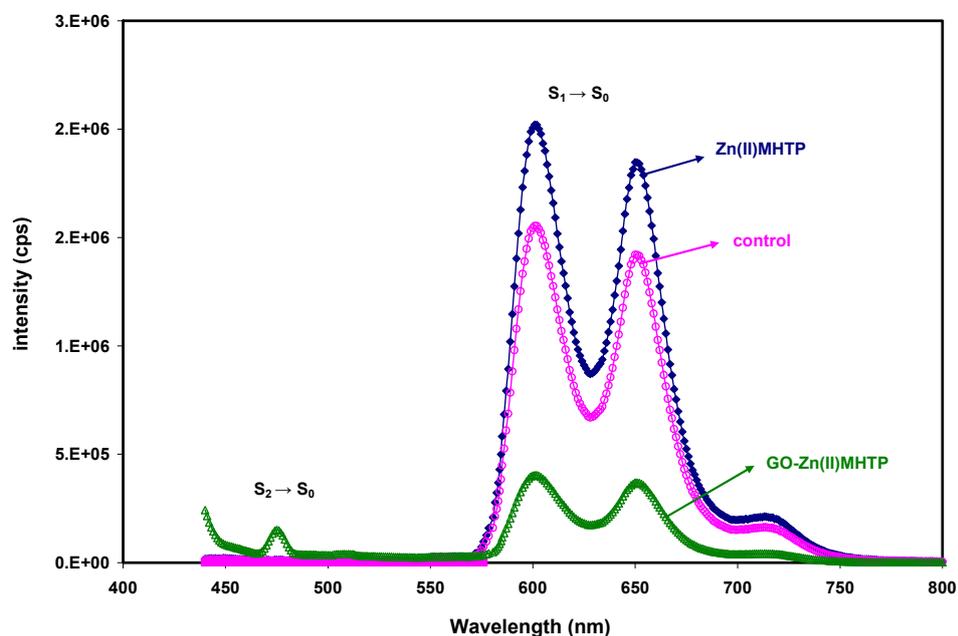


Figure S1. Steady state emission spectra of Zn porphyrin, the control sample, and Zn porphyrin-GO in chloroform, with the normalization of the absorbance of the Soret band excitation wavelength (420 nm) to the same value (0.18)

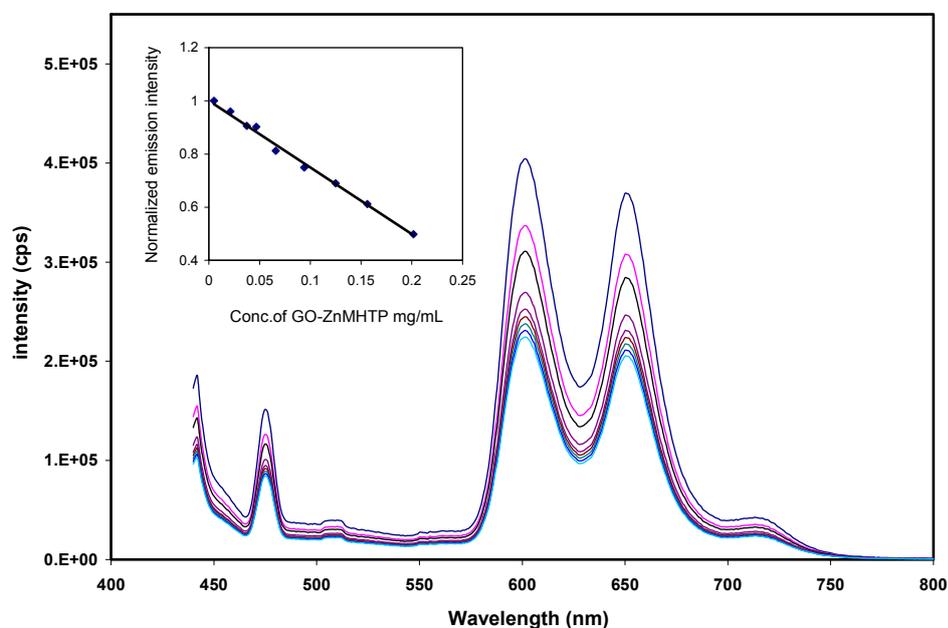


Figure S2. Fluorescence quenching behaviour of Go-Zn porphyrin. Inset shows emission normalized intensity with respect to concentration of graphene-Zn porphyrin porphyrin composite.

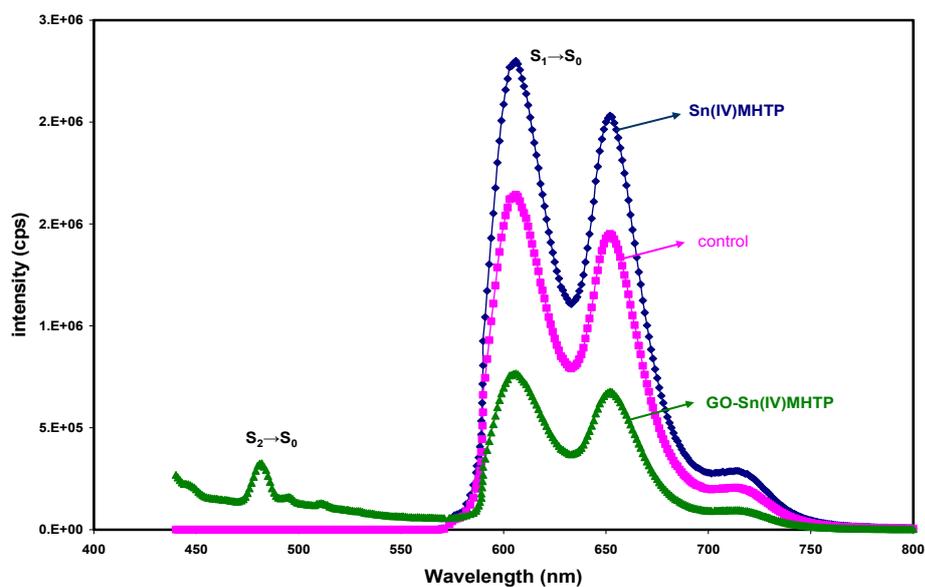


Figure S3. Steady state emission spectra of Sn porphyrin, the control sample, and Sn porphyrin-GO in chloroform, with the normalization of the absorbance of the Soret band excitation wavelength (420 nm) to the same value (0.18)

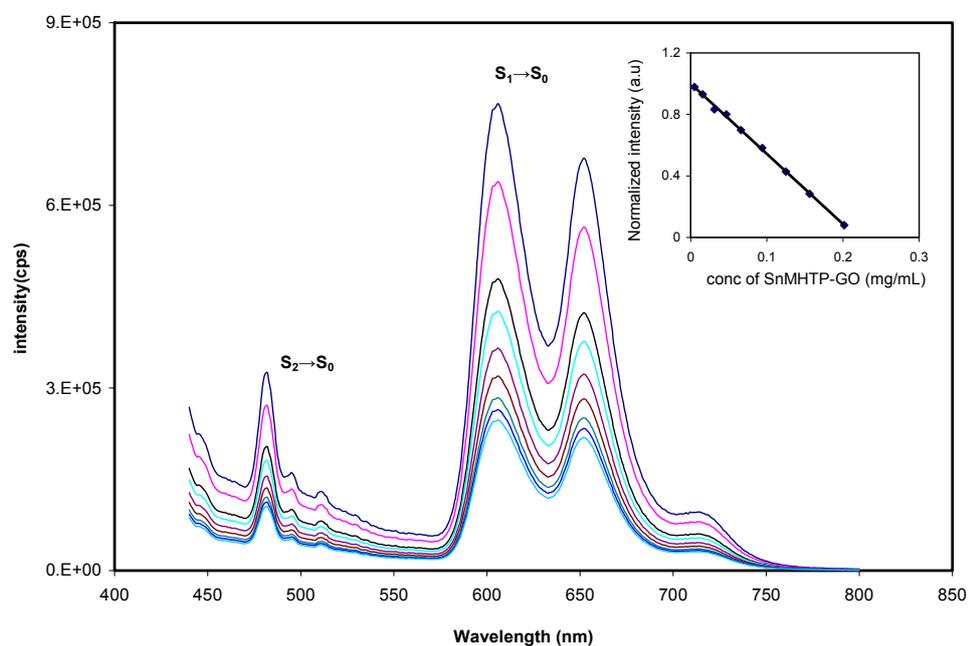


Figure S4. Fluorescence quenching behaviour of Go-Sn porphyrin. Inset shows emission normalized intensity with respect to concentration of graphene-Sn porphyrin porphyrin composite.

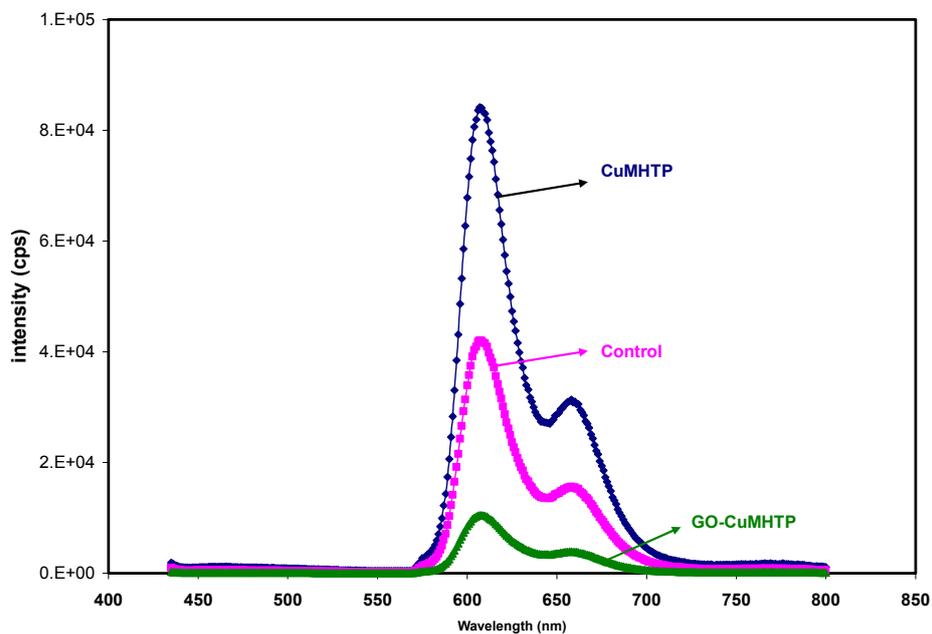


Figure S5. Steady state emission spectra of Cu porphyrin, the control sample, and Cu porphyrin-GO in chloroform, with the normalization of the absorbance of the Soret band excitation wavelength (420 nm) to the same value (0.18).

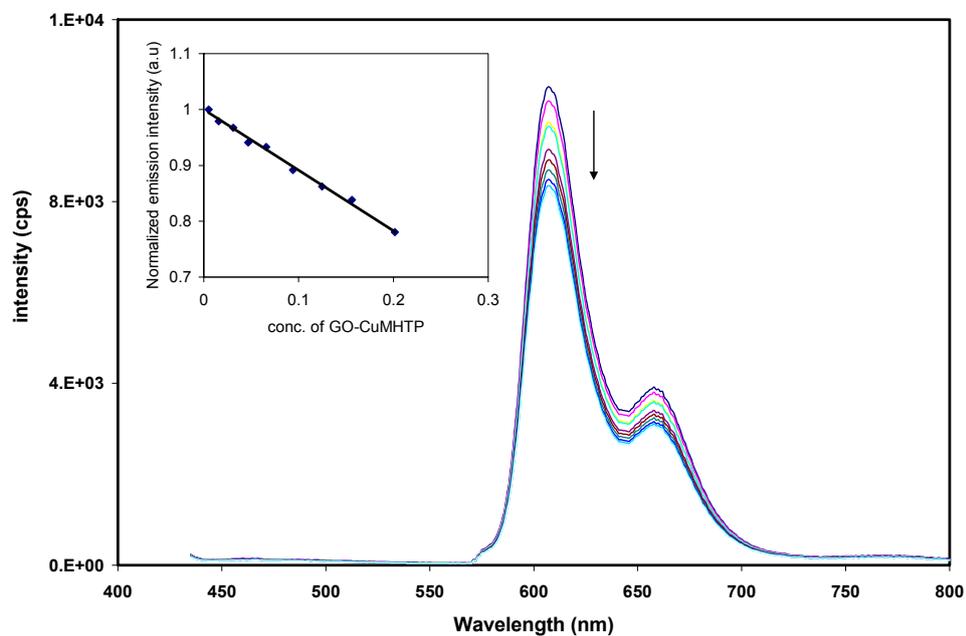


Figure S6. Fluorescence quenching behaviour of Go-Cu porphyrin. Inset shows emission normalized intensity with respect to concentration of graphene-Cu porphyrin porphyrin composite.

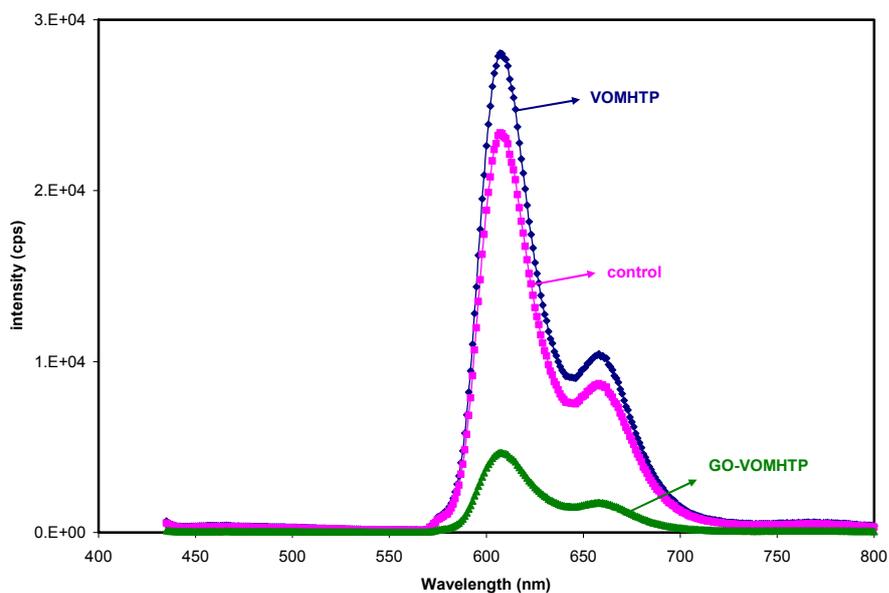


Figure S7. Steady state emission spectra of VO porphyrin, the control sample, and VOporphyrin-GO in chloroform, with the normalization of the absorbance of the Soret band excitation wavelength (420 nm) to the same value (0.18).

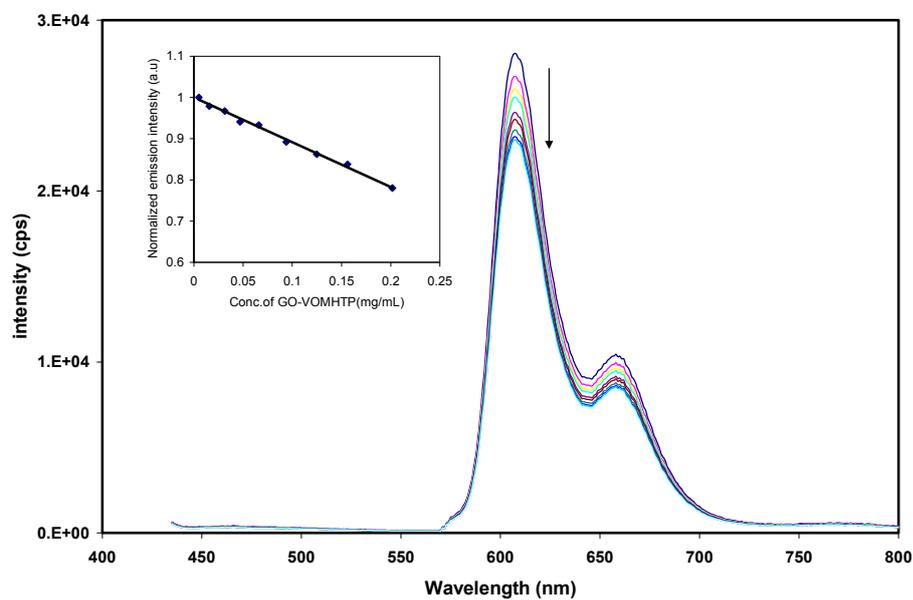


Figure S8. Fluorescence quenching behaviour of Go-VO porphyrin. Inset shows emission normalized intensity with respect to concentration of graphene-VO porphyrin porphyrin composite.

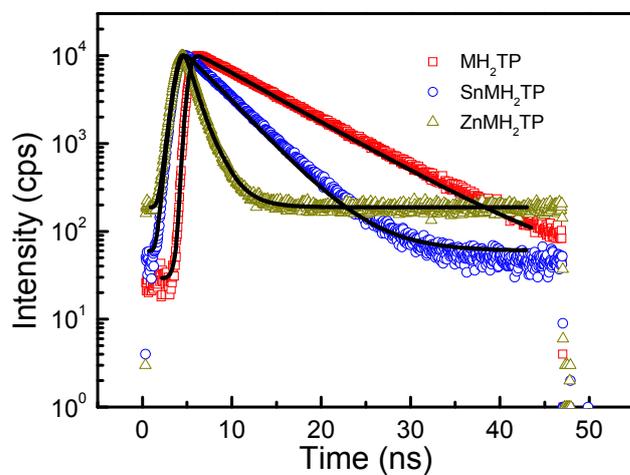


Figure S9: The fluorescence lifetime decay of various porphyrin molecules. Symbol represents experimental data and solid line represents theoretical fit.

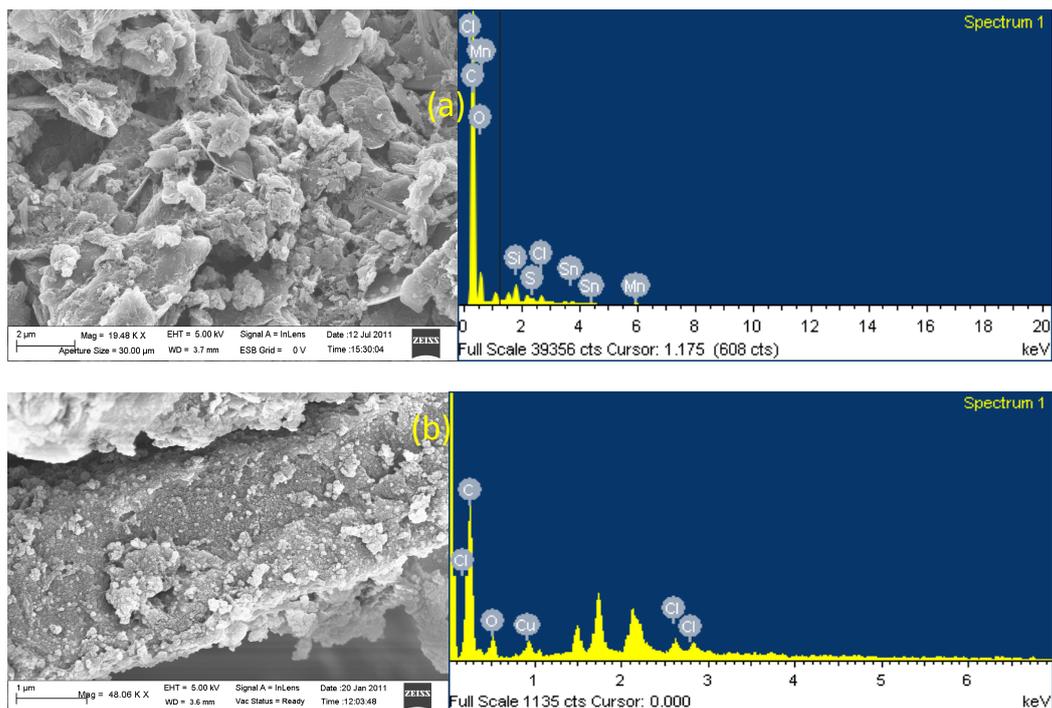


Figure S10: FE-SEM and EDS images of a) GO-Sn Porphyrin and b) GO- Cu Porphyrin composites

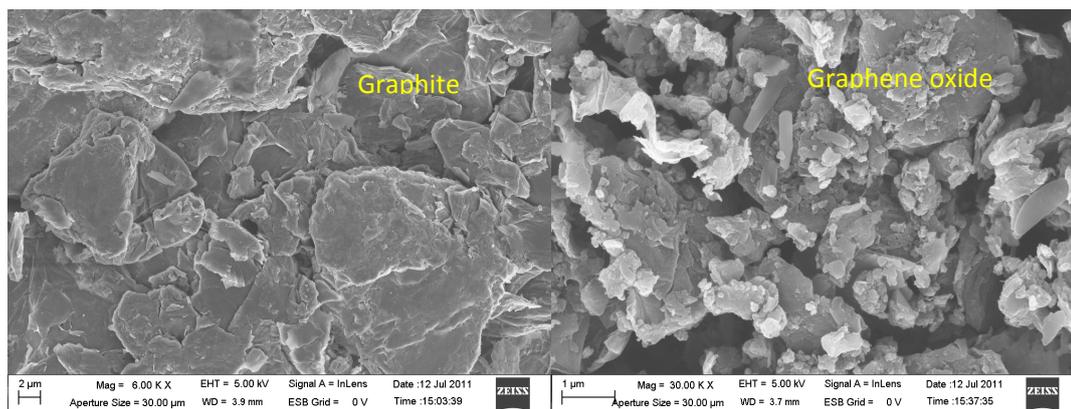


Figure S11. FE-SEM image of graphite and Graphene oxide

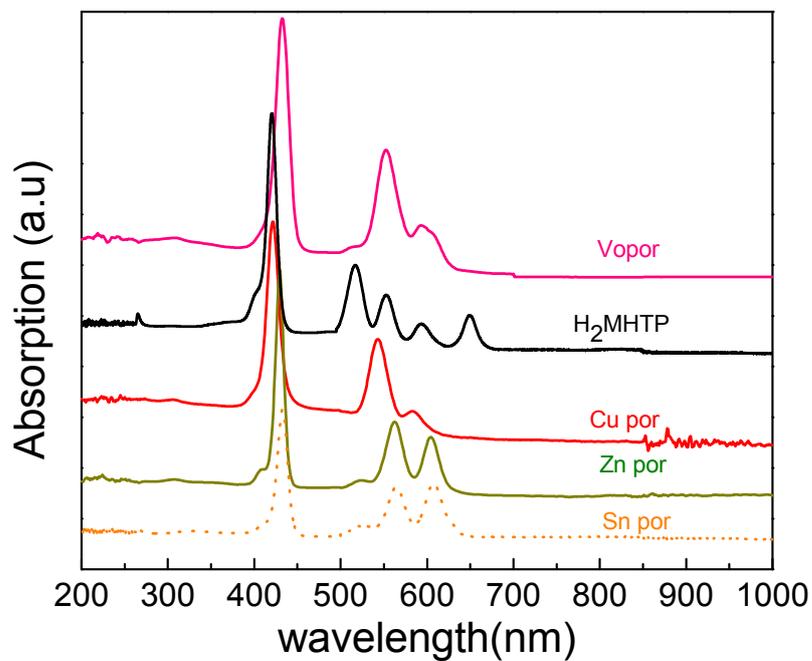


Figure S12: UV-visible absorption spectra of copper porphyrin, zinc porphyrin composite, tin porphyrin composite, VO porphyrin and H<sub>2</sub>MHTP in DMF. The absorbance in the region 500 nm to 890 nm amplified by 10 times for clear visibility.

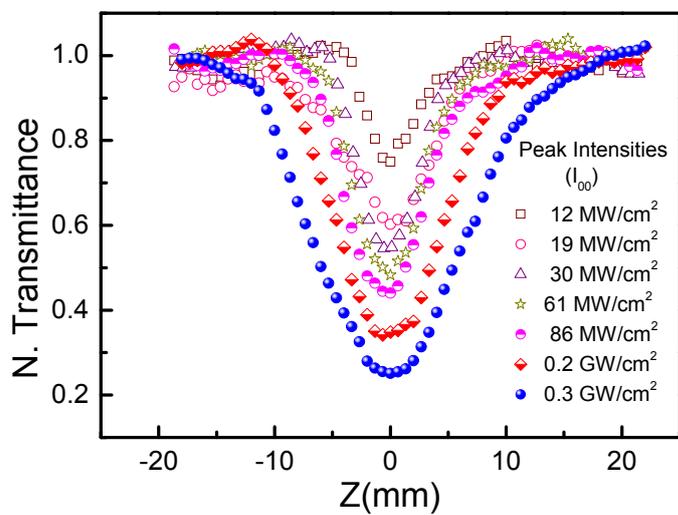


Figure S13: Intensity dependent open aperture Z-scan curves for GO-H<sub>2</sub>MHTP composite material.

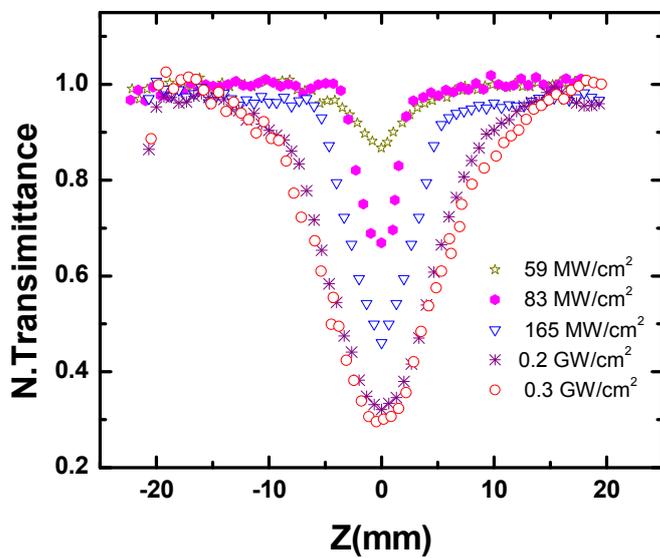


Figure S14: Intensity dependent open aperture Z-scan curves for GO-Cu porphyrin composite material.

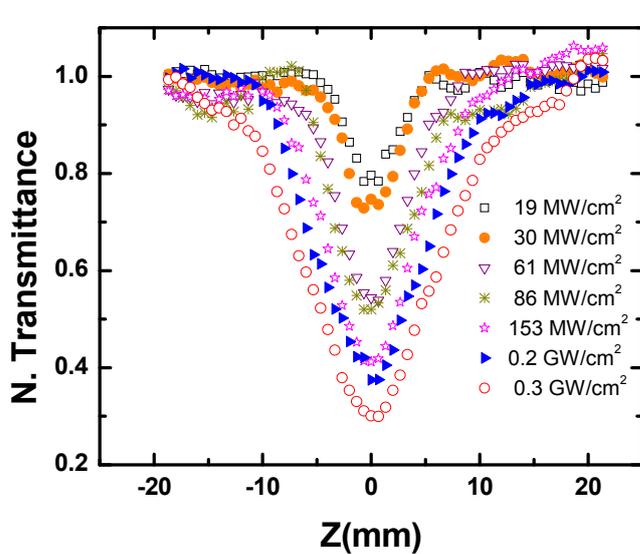


Figure S15: Intensity dependent open aperture Z-scan curves for GO-VO porphyrin composite material.

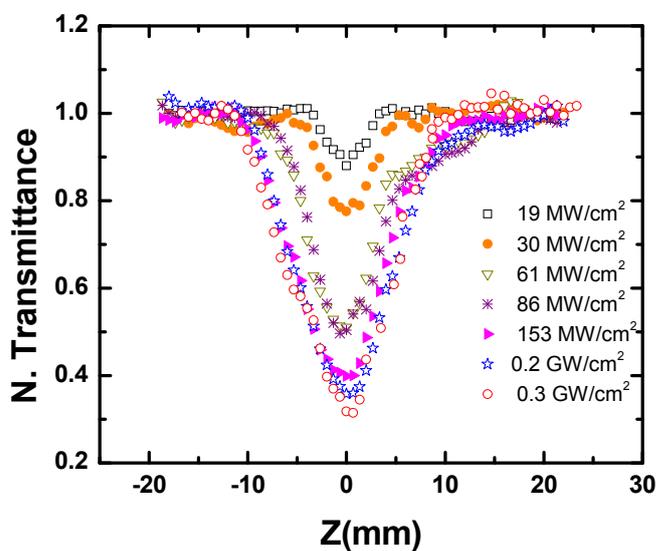


Figure S16. Intensity dependent open aperture Z-scan curves for GO-Sn porphyrin composite material.

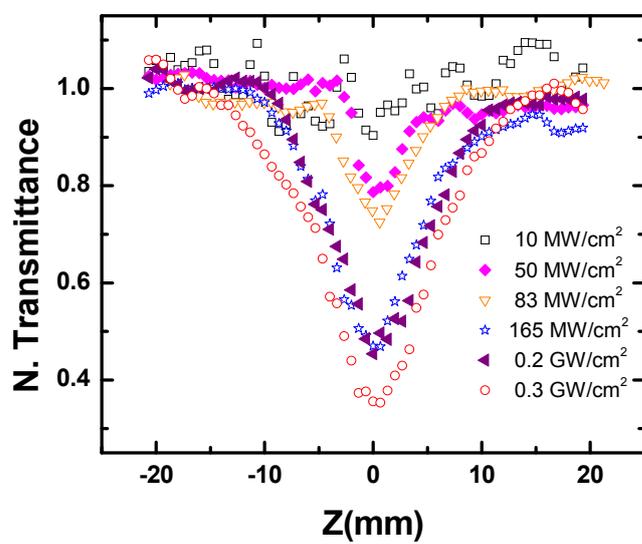


Figure S17: Intensity dependent open aperture Z-scan curves for GO-Zn porphyrin composite material.

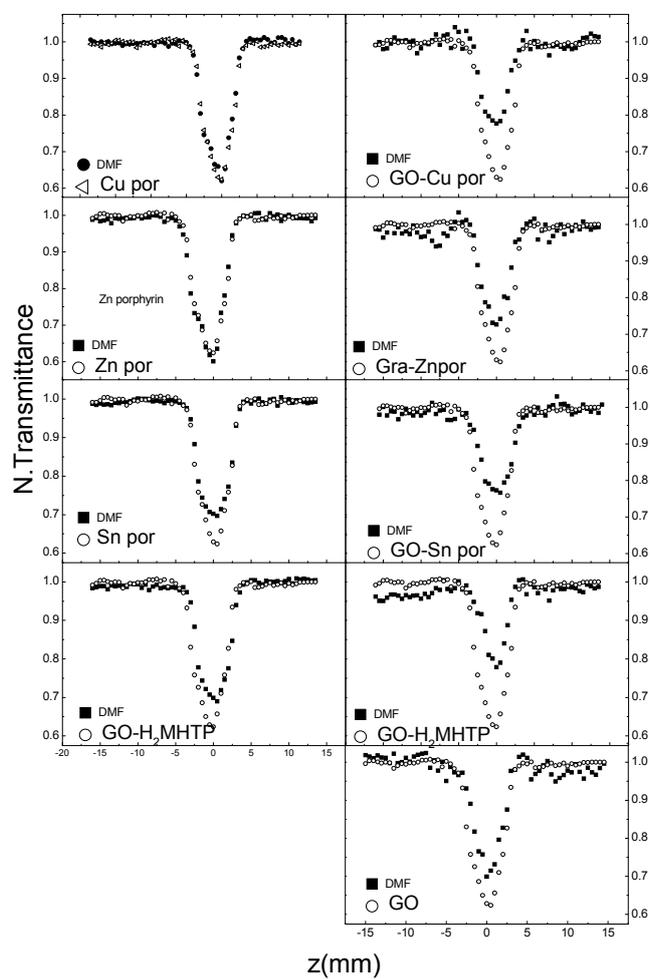


Figure S18: Open aperture Z-scan curves of pure porphyrins, GO and GO-porphyrin composites at 800 nm, fs regime before removing the solvent contribution.

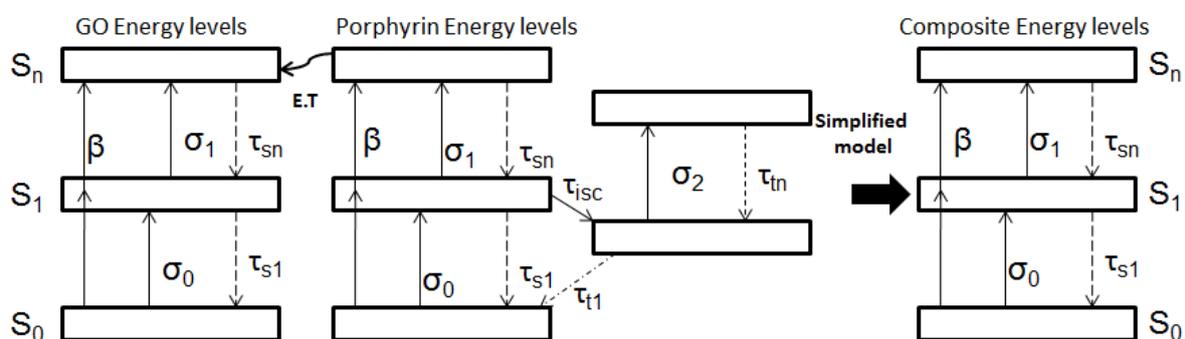


Figure S19: Schematic energy-level diagram of graphene oxide-porphyrin composite and its simplified model.

porphyrin	absorption		Steady state emission		lifetime(ns)
	Soret Band (nm)	Q-band (nm)	$\lambda_{ex}$ (nm)	$\lambda_{em}$ (nm)	
H <sub>2</sub> MHTP	420	517,553,594,650	420	650, 718	9.2
Zn porphyrin	429	563, 605	420	472, 592, 652	1.4
Cu porphyrin	421	544,583	420	594, 649	----
Sn porphyrin	433	564, 609	420	483, 599,654	4.1
VO porphyrin	432	553, 594	420	593, 647	----

Table SA: Optical absorption and Emission maxima, Lifetime of singlet state, quenching rate constant of pure porphyrin molecules.