

Supporting Information

Synthesis of graphene oxide with lower band gap and study of charge transfer interaction with perylenediimide

Komal Bhardwaj,^{1,2} Rachana Kumar,^{1,2*} Naveen Joy Kindo,¹ Nikita Vashistha,^{2,3} Akhilesh Kumar Patel,⁴ Mahesh Kumar,^{2,3} Pramod Kumar,⁵

¹Photovoltaic Metrology Group, Advanced Materials and Devices Metrology Division, CSIR-National Physical Laboratory, Dr. K. S. Krishnan Marg, New Delhi, India-110012

²Academy of Scientific and Innovative Research, HRDC Campus-Ghaziabad, India-201002

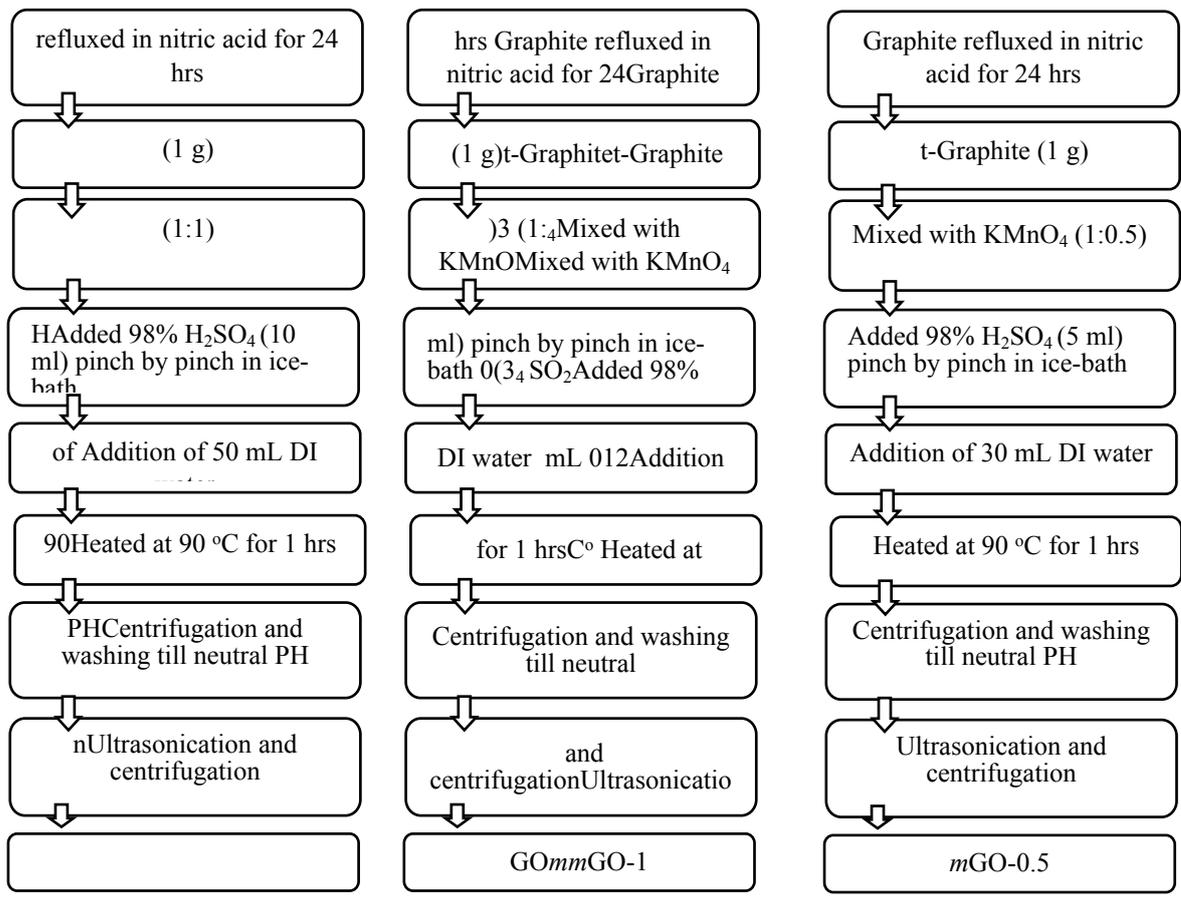
³Photonics Materials Metrology Group, Advanced Materials and Devices Metrology Division, CSIR-National Physical Laboratory, Dr. K. S. Krishnan Marg, New Delhi, India-110012

⁴Magnetic Materials Laboratory, Department of Physics, Indian Institute of Technology Bombay, Mumbai, India-400076

⁵Spintronics and Magnetic Materials Laboratory, Indian Institute of Information Technology, Allahabad, Uttar Pradesh India-211015

*Corresponding Authors

E-mail: rachanak.npl@nic.in, rachanasinghchem@gmail.com (Rachana Kumar)



Scheme S1. Synthesis scheme of mGO, mGO-1 and mGO-0.5 with the photograph of their dispersion in water (1mg/mL).

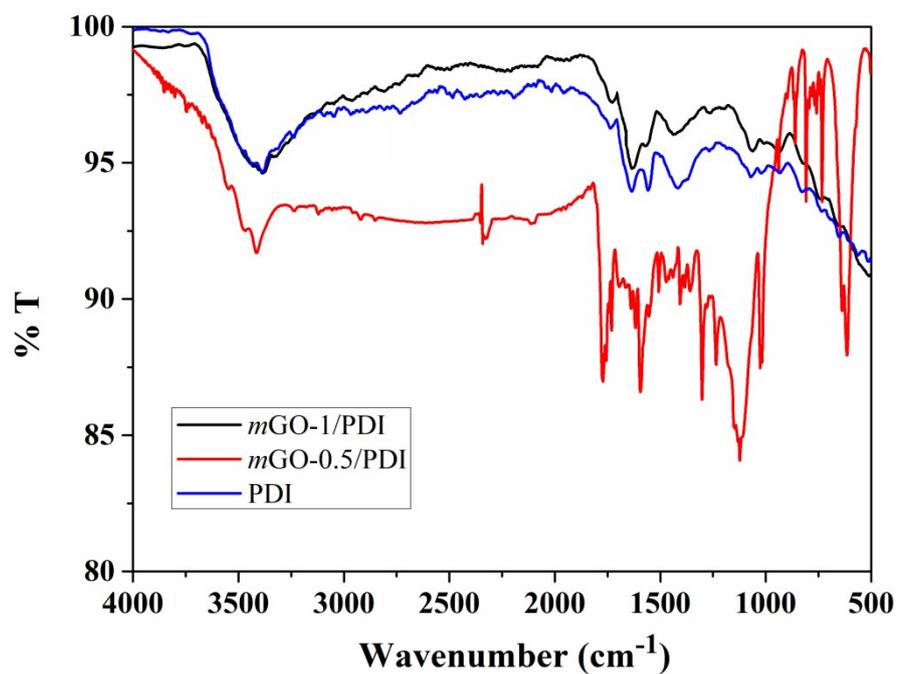


Figure S1a. FTIR spectra of PDI, mGO-1/PDI and mGO-0.5/PDI.

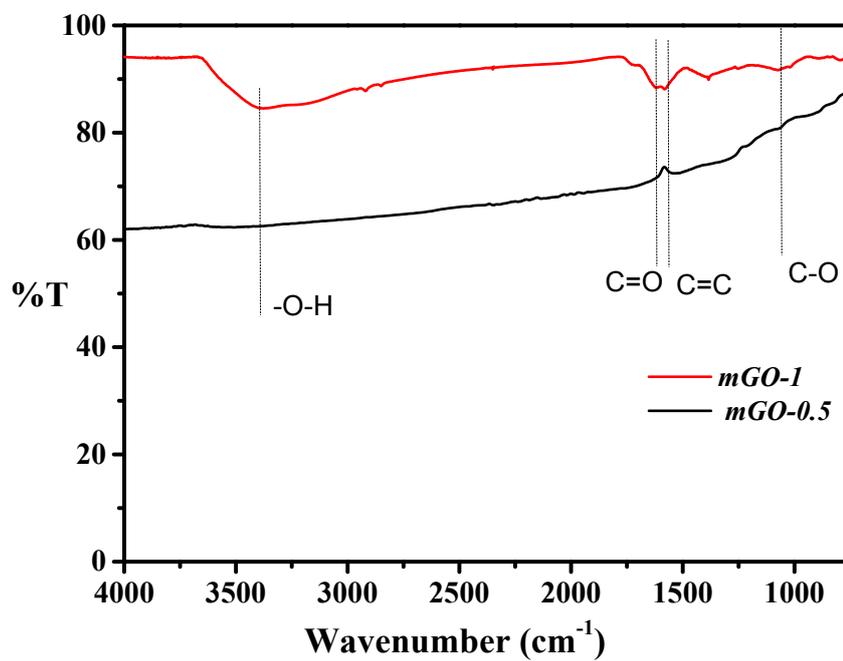


Figure S1b. FTIR spectra of mGO-1 and mGO-0.5.

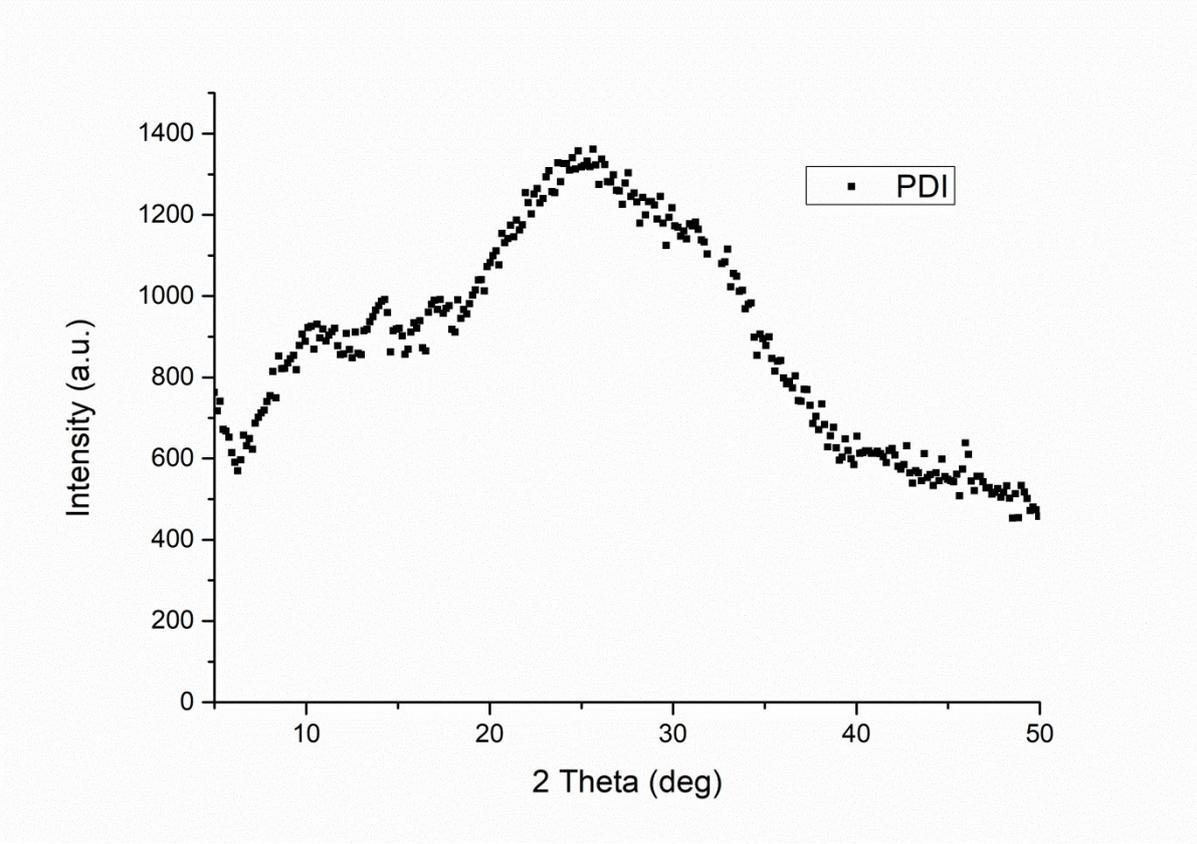


Figure S2. XRD of PDI in film.

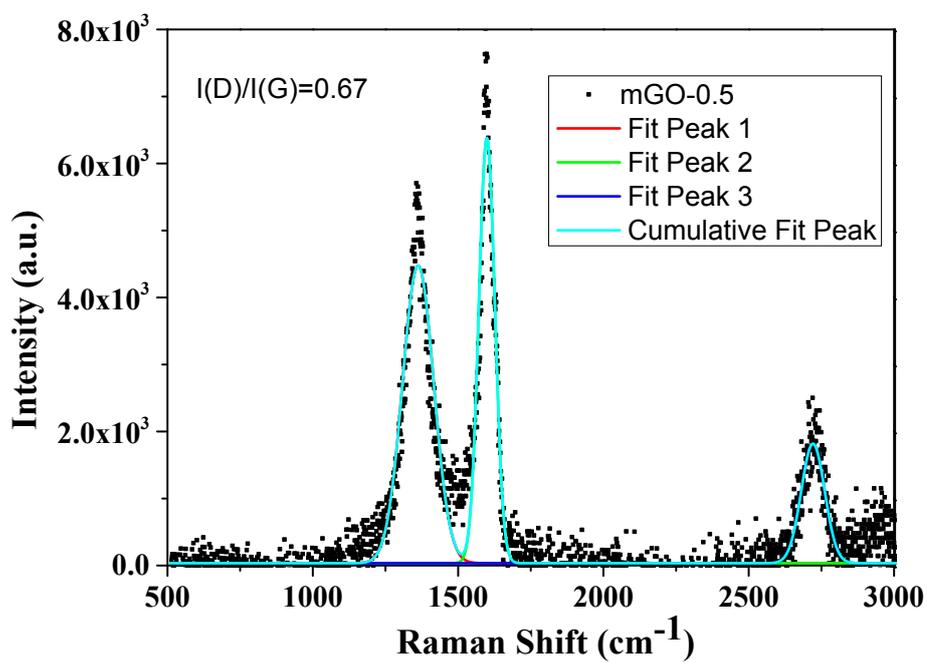
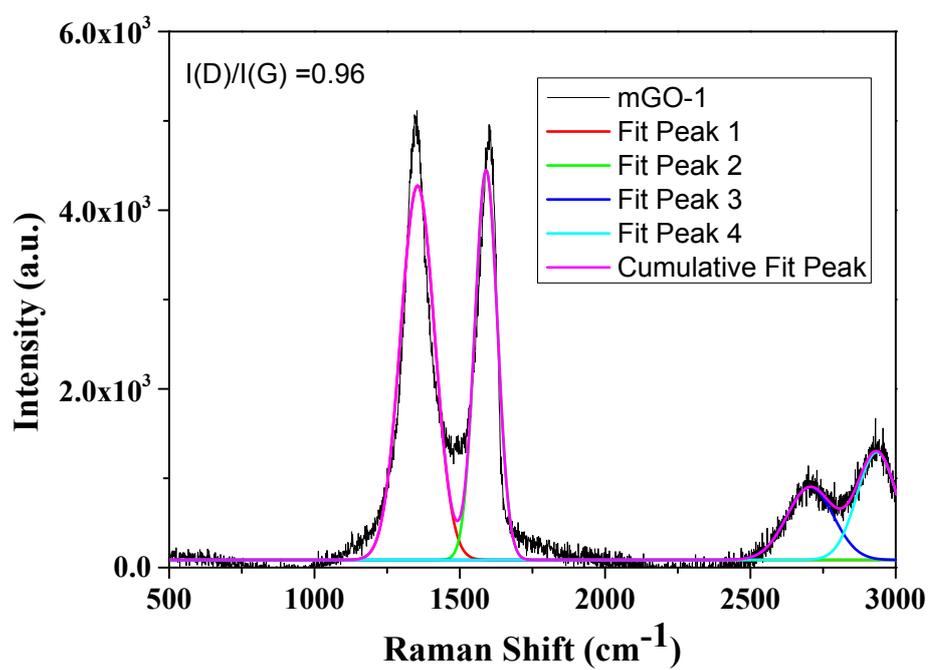


Figure S3. Fitting of Raman spectra of mGO-1 and mGO-0.5 with Gaussian line for calculation of $I(D)/I(G)$ value.

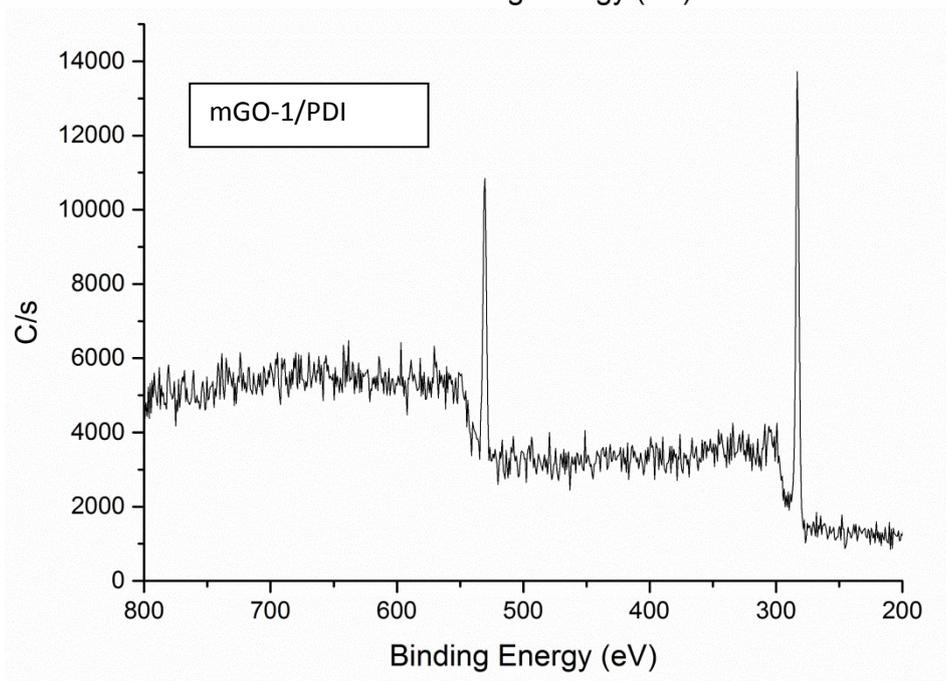
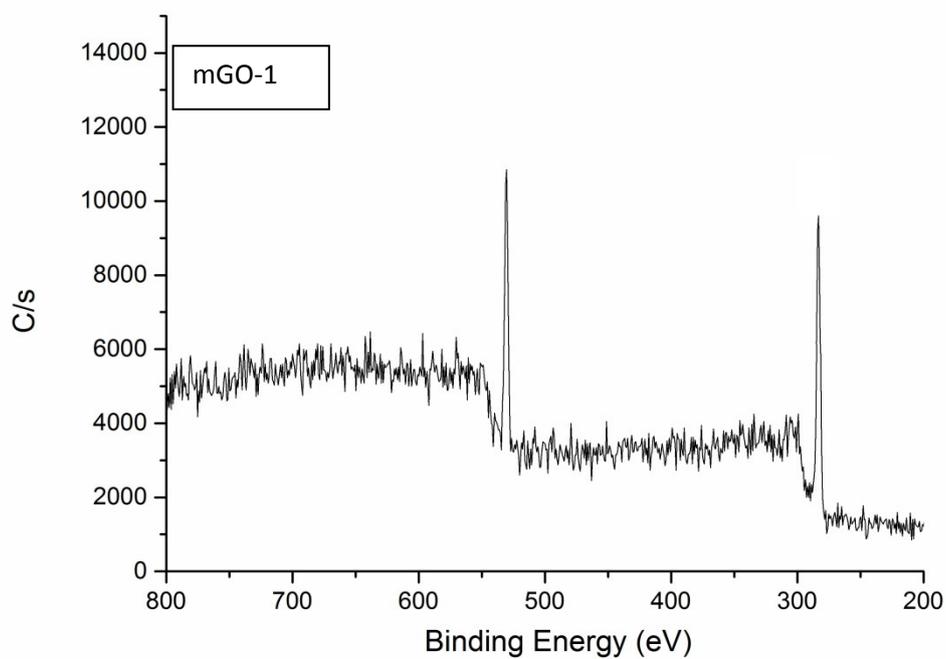


Figure S4a. XPS survey spectra of *mGO-1* and *mGO-1/PDI*.

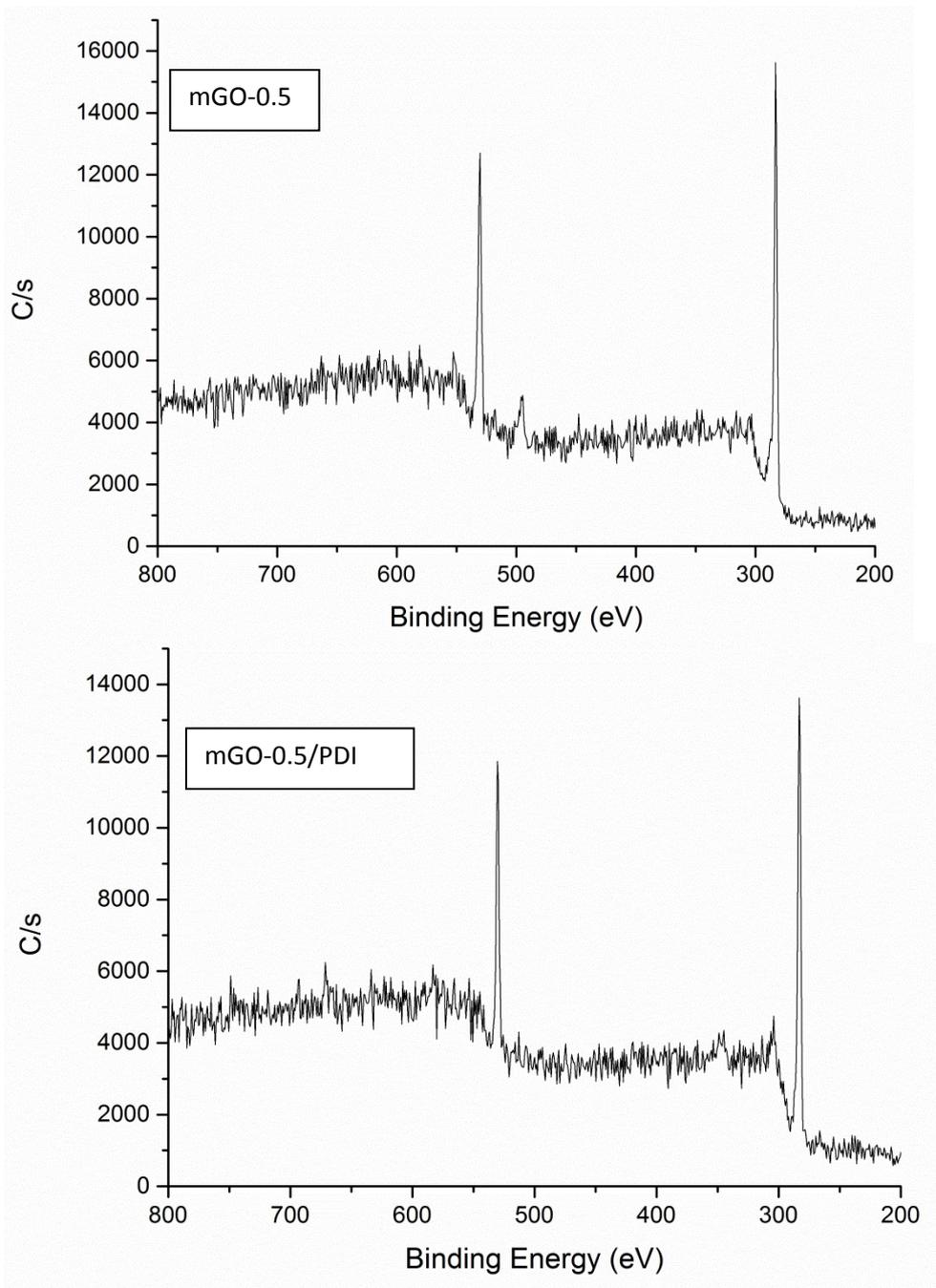


Figure S4b. XPS survey spectra of *mGO-0.5* and *mGO-0.5/PDI*.

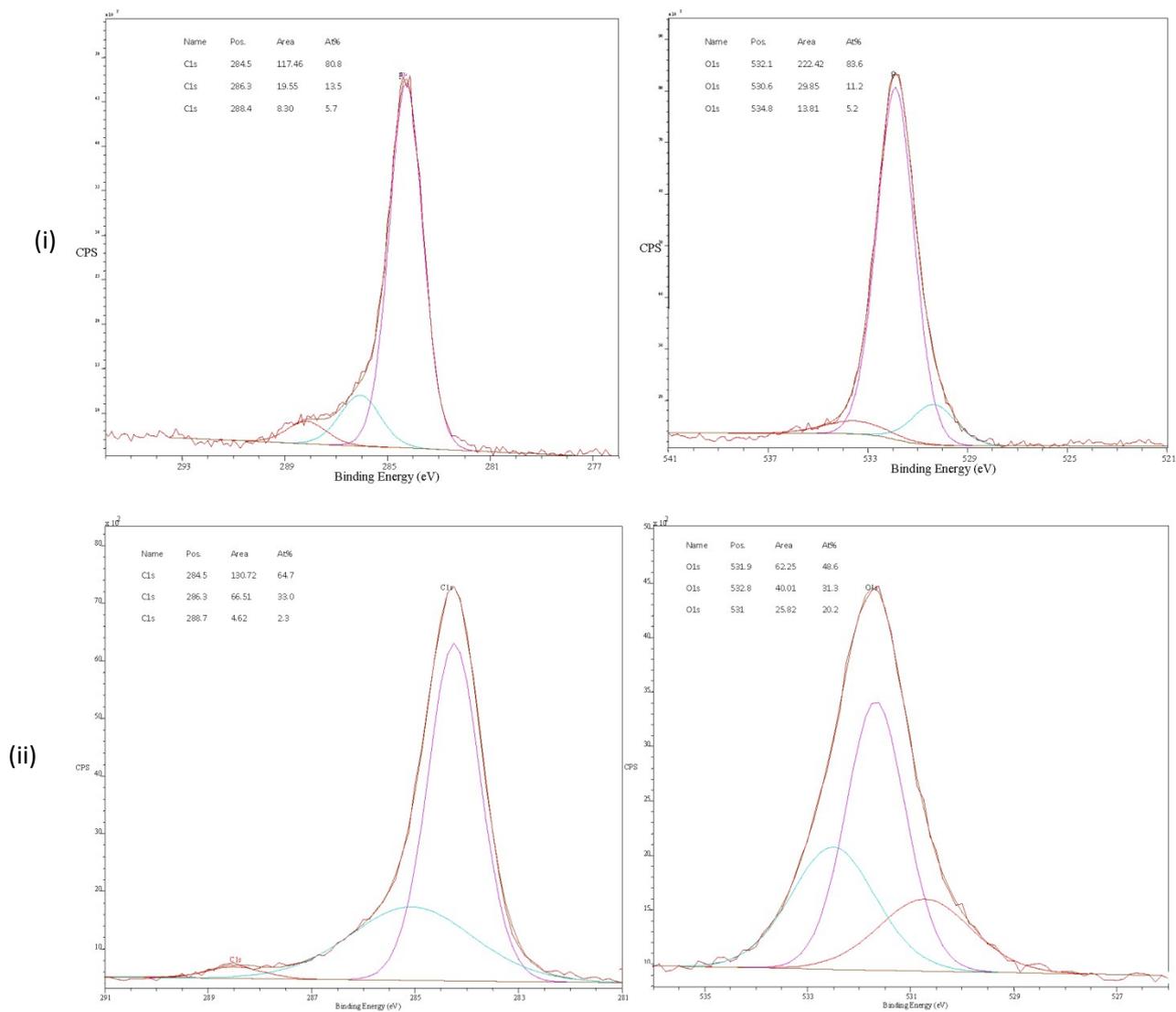


Figure S4c. C1s and O1s core level XPS peak fit of (i) *mGO-1*, and (ii) *mGO-1/PDI*.

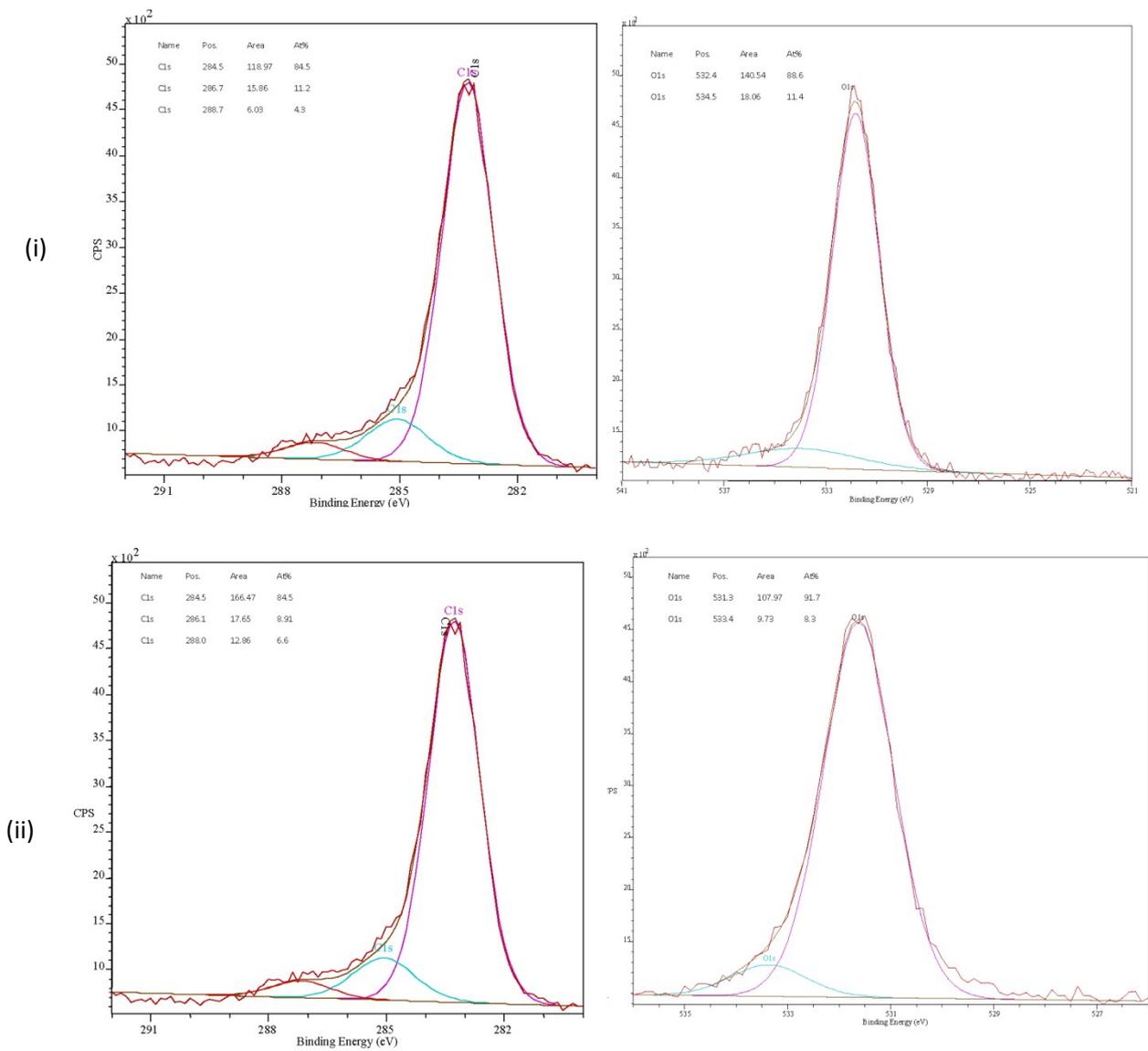


Figure S4d. C1s and O1s core level XPS peak fit of (i) *mGO-0.5*, and (ii) *mGO-0.5/PDI*.

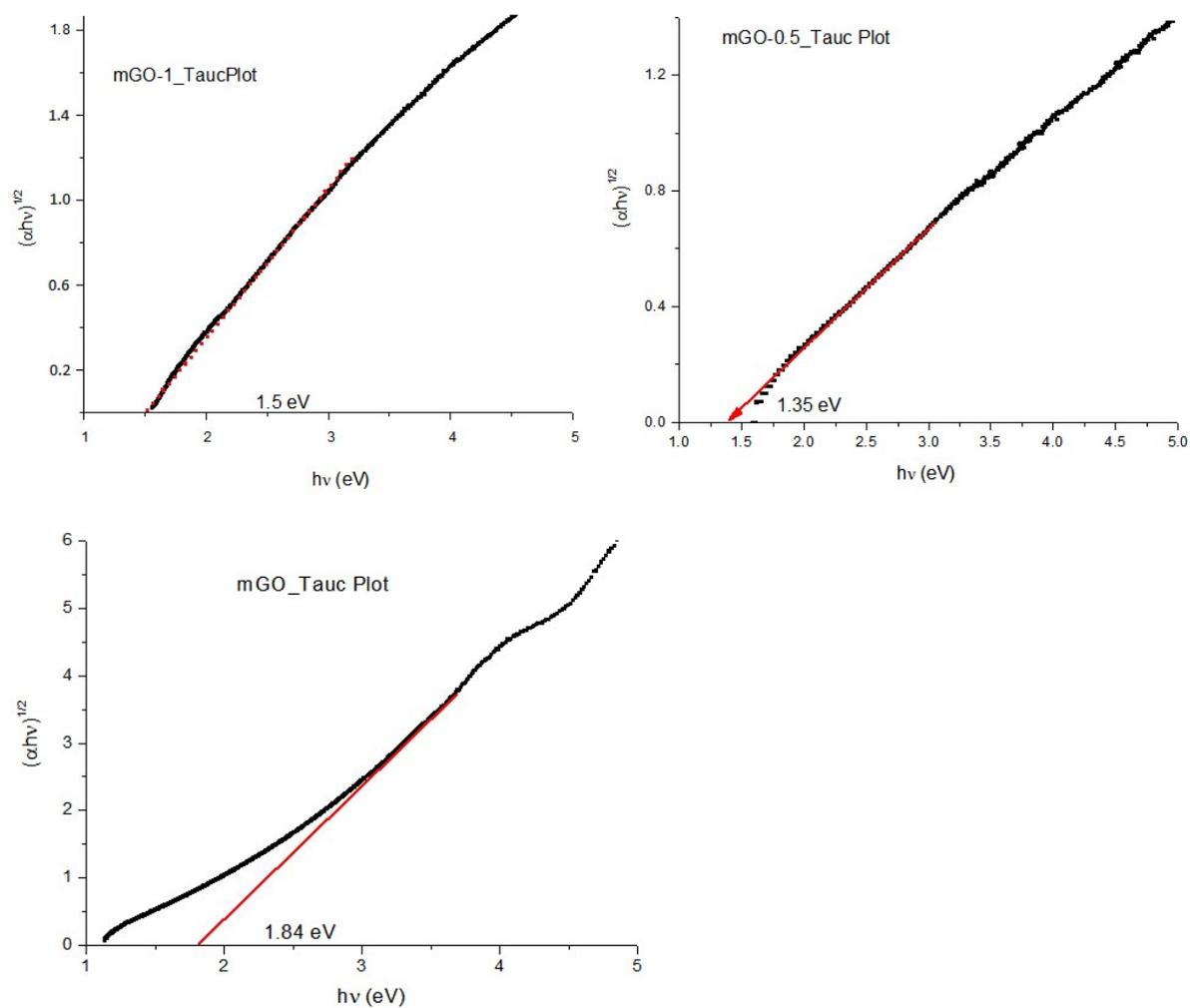


Figure S5. Tauc plot of mGO-1, mGO-0.5 and mGO for band gap estimation.

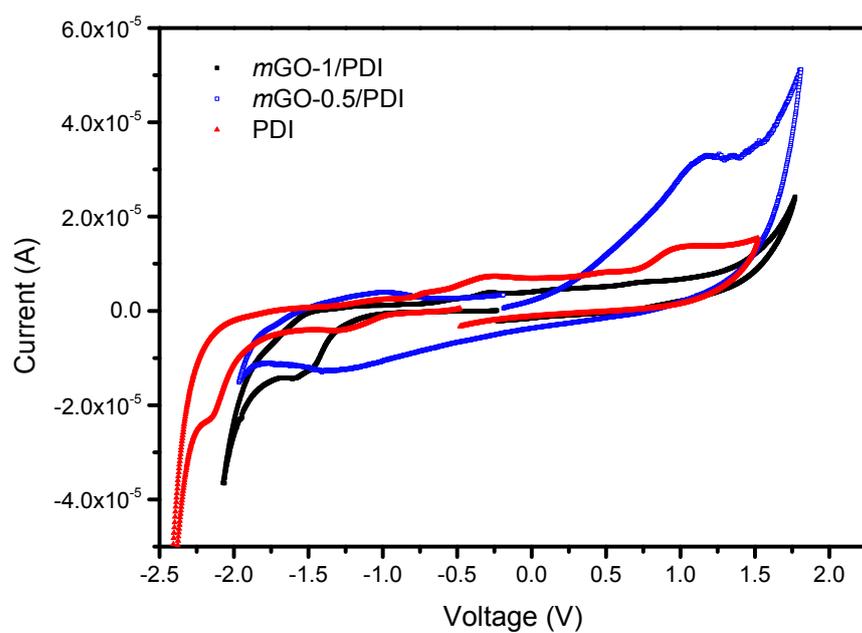
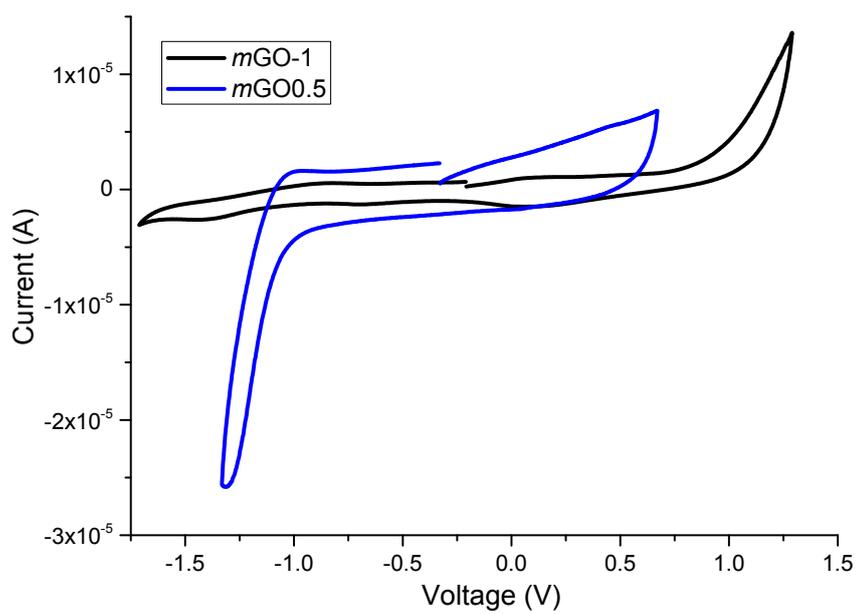


Figure S6. Cyclic voltammogram of *mGO-1*, *mGO-0.5*, PDI and GO hybrids with PDI.

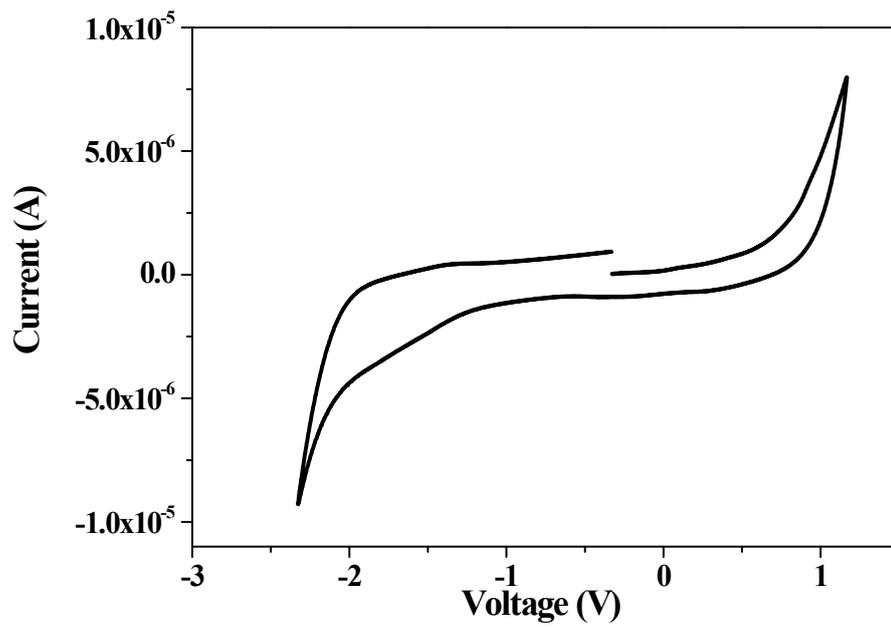


Figure S7. Cyclic voltammogram of mGO drop casted on working.

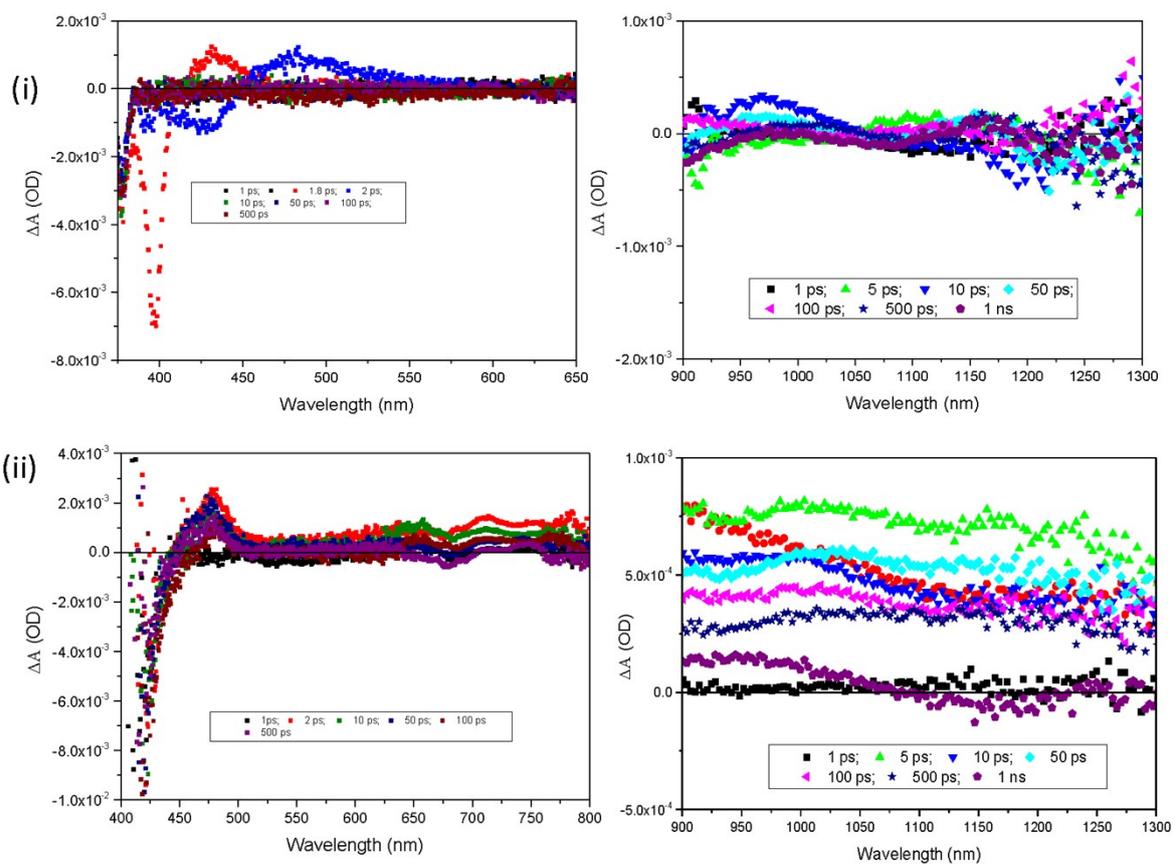


Figure S8. Transient absorption spectra of (i) mGO-1 and (ii) mGO-1/PDI hybrid recorded in visible and NIR region.

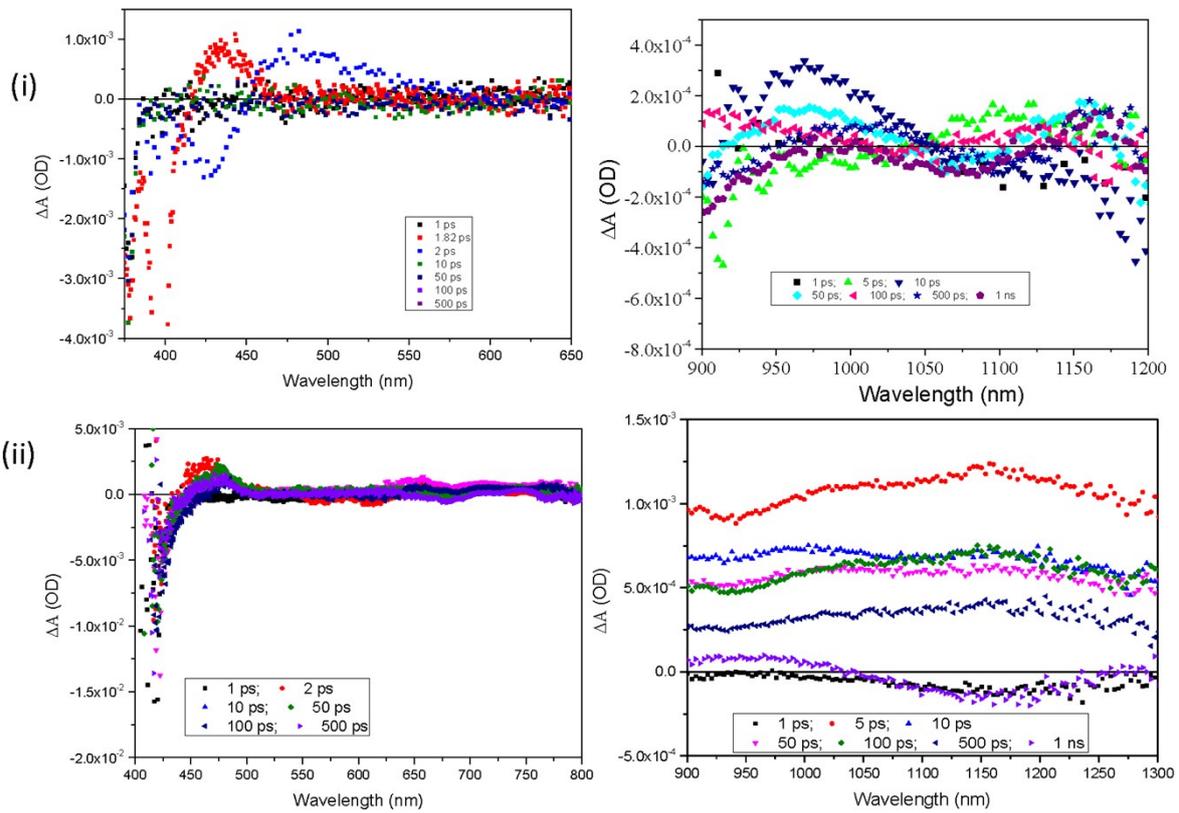


Figure S9. Transient absorption spectra of (i) mGO-0.5 and (ii) mGO-0.5/PDI hybrid recorded in visible and NIR region.