**ABSTRACT**

Probing interaction between dyes and reduced [graphene oxide](https://www.sciencedirect.com/topics/chemistry/graphene-oxide) (rGO) is of contemporary research interest. Since, rGO is widely used as [electron acceptor](https://www.sciencedirect.com/topics/chemistry/electron-acceptor) in photovoltaic and [optoelectronic](https://www.sciencedirect.com/topics/chemistry/optoelectronics) devices. Hence, we have investigated the interaction between [protoporphyrin](https://www.sciencedirect.com/topics/chemistry/protoporphyrin) IX (PPIX) and rGO by vital spectroscopic techniques. The adsorption of PPIX on rGO is studied by Attenuated total reflection-Fourier transform infrared (ATR-FTIR) and X-ray [photoelectron](https://www.sciencedirect.com/topics/chemistry/photoelectron) spectroscopic (XPS) measurements. The [fluorescence quenching](https://www.sciencedirect.com/topics/chemistry/fluorescence-quenching) measurements are also performed and the [fluorescence intensity](https://www.sciencedirect.com/topics/chemistry/fluorescence-intensity) of PPIX is quenched by rGO. The quenching of PPIX with rGO is evaluated by the Stern–Volmer equation and time-resolved [fluorescence lifetime](https://www.sciencedirect.com/topics/chemistry/fluorescence-lifetime) studies. The results revealed that the fluorescence quenching of PPIX with rGO is due to the static quenching mechanism. The dominant process for this quenching has been attributed to the process of electron transfer from excited state PPIX to rGO. Fluorescence lifetime measurements were used to calculate the rate of electron transfer process between excited state of PPIX and rGO. Transient absorption studies demonstrated the formation of PPIX [cation radical](https://www.sciencedirect.com/topics/chemistry/radical-cation) for the evidence of electron transfer between PPIX and rGO.