Graphene Functionalization for Sensing

Michal Otyepka

1 Czech Advanced Technology and Research Institute (CATRIN), Regional Centre of Advanced Technologies and Materials (RCPTM), Palacký University Olomouc, Olomouc, Czechia
2 IT4Innovations, National Supercomputing Center, VŠB-TUO, Ostrava, Czechia

Michal.Otyepka@upol.cz

Graphene emerges as a very interesting material with a range of potential sensing applications. Introducing covalent chemical functionalities to graphene promises materials that yield valuable sensing responses. While direct functionalization of graphene poses challenges due to its innate inertness, the chemistry of fluorographene represents a breakthrough enabling an alternative avenue for creating a diverse and wide spectrum of graphene derivatives with covalently mounted chemical functional groups from small chemical moieties (e.g., nitre of carboxyl groups) up to enzymes and aptamers. Notably, their low resistivity renders them exceptionally suitable for electrochemical sensing. This presentation will offer insights into the spectrum of graphene derivatives, exploring their roles in electrochemical and optical sensing. Additionally, future perspectives of this intriguing class of graphene derivatives will be presented.