Graphene and other 2D materials based gas sensors

Wojtek Wlodarski

School of Electrical and Computer Engineering
RMIT University
Melbourne, AUSTRALIA

The application of graphene for the gas sensing has become recently a new fast growing area of interest. Graphene has the tremendous potential for developing gas and vapour sensors. This is in part due to the fact that each atom in the structure interacts directly with the sensing environment and in part due to the ease with the electronic properties of graphene can be modified by this interaction. Graphene and other 2D materials could be combined with different transducing platforms such as: conductometric, Surface Acoustic Waves (SAW), Schottky diodes, mass sensitive, field effect transistors, optical as well as based on the noise spectra measurements. Combining these transducers with graphene and other 2D materials results in the development of new generation of sensitive, reversible and stable gas and vapour sensors with several advantages which will be discussed. Numerous examples of recently developed gas and vapour sensors for: NO_2, CO, CO_2, SO_2, H_2, NH_3, CH_4,VOC and H_2O will be presented.