



Canadian Association
of Physicists

Association canadienne
des physiciens et physiciennes

Contribution ID: 320

Type: Oral (Non-Student) / Orale (non-étudiant(e))

Development of graphene-based field-effect transistor (GFET) sensors for a simulant of chemical warfare agents

Monday, June 7, 2021 3:55 PM (5 minutes)

Chemical warfare agents (CWAs) are potential threats to civil society and defence personnel. In recent years, many efforts have been deployed to develop a scalable, rapid and accurate detection system to identify trace amount of CWAs. Here we report a graphene-based field-effect transistor (GFET) sensor able to detect 800 ppb of dimethyl methyl phosphonate (DMMP), a simulant of the nerve agent sarin. We observe enhanced sensitivity when the GFET sensor is exposed to few mWs of UV light. Back gate measurements performed before and during exposures to the analyte allow us to investigate the sensing mechanism while monitoring the induced changes in carrier concentration and mobility in graphene.

Author: Dr RAUTELA, Ranjana

Co-authors: Dr PARK, Jaewoo (University of Ottawa, Canada); Dr CARVAJAL, Erika Natalia Alzate (University of Ottawa, Canada); SCARFE, Samantha (University of Ottawa); SCARFE, Lukas; Prof. LUICAN-MAYER, Adina (University of Ottawa); Prof. MÉNARD, Jean-Michel (University of Ottawa)

Presenter: Dr RAUTELA, Ranjana

Session Classification: M3-8 Applied Physics (DAPI) / Physique appliquée (DPAI)

Track Classification: Applied Physics and Instrumentation / Physique appliquée et de l'instrumentation (DAPI / DPAI)