



Collaborate with RISE to realize competitive Graphene-Based Sensors

Graphene opens new possibilities for sensor technology due to its properties, such as large surface-to-volume ratio, unique optical properties, excellent electrical conductivity, high carrier mobility/density and high thermal capacity. The large surface area enables enhancement of the surface loading of sensor-molecules. The excellent conductivity enables efficient transport carriers between sensor-molecules and electrodes.

RISE supports academic and industrial partners with development of smart and innovative sensor applications of graphene and other 2D materials. We cover the whole spectrum from material development to product implementation via process development and scale-up.

Examples of applications

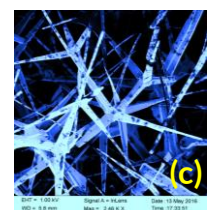
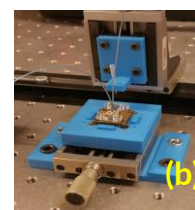
- Life-science and bio-chemistry
- Climate change and environmental monitoring
- Industrial processing inspection and monitoring
- RF and power electronics
- Temperature and thermal inspection
- UV/VIS/IR imaging
- Magnetic radiation detection
- Gas, flow, stain/stress mechanical sensors

Contact

Dr Qin Wang

qin.wang@ri.se

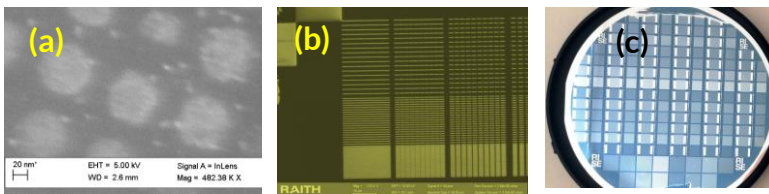
Tel: +46 707727838



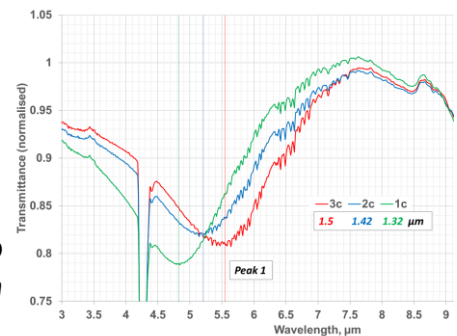
(a) Printed electronic sensors on flexible substrate. (b) Microfluidic setup for characterization of graphene-based sensors. (c) SEM image of chemically synthesized hybrids of graphene oxide and ZnO tetrapod.

Examples of graphene-based sensor development at RISE

- Amphetamine and cocaine sensors using large area CVD mono layer graphene and graphene quantum dots through collaboration with Swedish National Forensic Center (NFC).
- Glucose sensors utilizing chemically synthesized GO and RGO, as well epitaxy formed graphene-on-SiC substrate.
- Graphene-based printed strain and temperature sensors.
- Hybrids of graphene and ZnO tetrapods for dopamine sensing. The dopamine is one of important bio marks for early detection of Parkinson disease.
- Graphene on SiC membrane as thin ion transmission detectors to study the influence of low-dose particle radiation on living cells.
- Self-powered sensors using energy harvesting based on graphene-based materials



SEM images of plasmonic structures onto (a) and beneath (b) the CVD graphene monolayer, (c) Fabricated plasmonic structures and electrodes on 4" SiO₂/Si wafer, and (d) FTIR spectra of the fabricated plasmonic arrays.



Offers/support from RISE

- Support customized design, fabrication and verification of graphene-based sensors; R&D&I from laboratory up to pilot-scale.
- Collaboration projects with national and international multi-partners across full value chain.
- Consultancy for graphene sensing applications.
- Processing/characterization service and coaching/training/courses.
- Partnership and network.
- Access to technique platforms and test and demo facilities.

