



Graphene and Related 2D Materials

Technical Work Area 41

Project 1

Structural characterisation of CVD-grown graphene: Coverage on substrate, number of layers, level of disorder

Objectives

- Validate methodology for characterisation of CVD-grown graphene supported by a substrate, using Raman spectroscopy;
- Determine the uncertainties associated with the measurement and data analysis;
- Input into ISO TC229 JWG2, for ISO/PWI 21356 'Structural Characterisation of Graphene'.

Background

Graphene is predicted to impact many different application areas such as solar cells, biosensors, displays, composites, flexible electronics and energy storage due to its exceptional properties. One of graphene's many achievements is that it is the first truly two-dimensional material, being only 1 atom thick. The isolated research into a whole new family of other 2D materials has indicated that the new materials show exciting and complementary properties to graphene, revealing potential for many other industry applications.

Standardization Needs

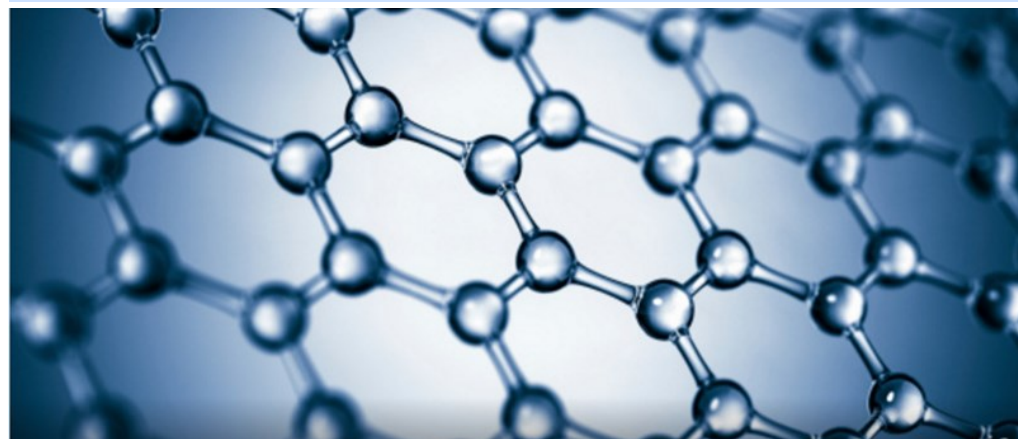
As industry uptake on this material increases, international standardization is critical to enable commercialization. Reliable, accurate, and reproducible measurements are important due to the multiple production routes and producers of the material in order to maintain quality in manufacture.

Several standards are under development within ISO TC229 'Nanotechnologies', jointly with IEC, including ISO/PWI 21356 'Structural characterisation of graphene', which will focus on determining the physical properties of graphene flakes and CVD-grown graphene. This will require interlaboratory comparisons to help develop best practice and understand the associated uncertainties.

Work Programme

CVD-grown graphene transferred onto SiO₂ will be used for Raman spectroscopy measurements. The CVD-grown graphene will be sourced by an industrial collaborator. Samples will be prepared by the project leadership and

Call for Participation



provided to each participant following a normalisation spectra measurement by Raman spectroscopy.

Deliverables and Dissemination

This interlaboratory study will be disseminated in a peer-reviewed scientific journal, and used to develop ISO/PWI 21356 (Nanotechnologies -- Structural characterisation of graphene)

International Participation

Current participation includes volunteers from Australia, Brazil, China, France, Spain, UK and USA. More volunteers are welcome.

Funding

Participants fund their own involvement in the project.

Project Status

Approved by the VAMAS Steering Committee for start-up.

The project is due to start in May 2017

For more information on participation, please contact:

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