



Graphene and Related 2D Materials

Technical Work Area 41

Project 3

Chemical composition of G/GO flakes: Elemental analysis and Oxygen content using X-ray photoelectron spectroscopy (XPS)

Objectives

This project aims to validate methodology for measuring the elements, especially carbon and oxygen content of graphene (G) and graphene oxide (GO) flakes in a powder form, using X-ray photoelectron spectroscopy (XPS).

Determine the uncertainties associated with the measurement and data analysis.

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 industrial applications.

Standardization Needs

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

Several standards are under development within ISO TC 229 'Nanotechnologies', jointly with IEC TC 113, that are focused on the measurement of specific properties of graphene produced through different methods. There is currently a need for measurement standards that address the determination of chemical properties including main elements, oxygen content and C/O ratio.

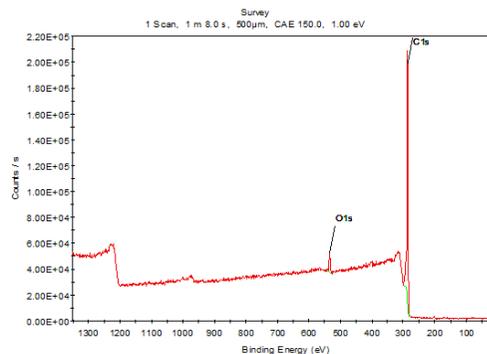
Work Programme

The graphene (G) and graphene oxide (GO) will be sourced by the industrial collaborators.

Main elements, oxygen content and

C/O ratio will be measured.

Call for Participation



- VAMAS Technical Report
- This study will be reported to ISO/TC229 or IEC/TC113 for consideration towards future international standardization.

Funding

Participants fund their own involvement in the project.

Project Status

Approved for start-up by the VAMAS Steering Committee.

Call for international participants.

This project is due to start in December 2017 for a duration of 6 months.

To register your interest to participate, please contact:

Dr. Lingling Ren

Co-Chair, VAMAS TWA 41
National Institute of Metrology, China
Email: renll@nim.ac.cn

Dr. Renxiao Liu & Guanglu Ge

Project Leader
National Center for Nanoscience and Technology, China
Email: liurx@nanoctr.cn
gegl@nanoctr.cn

C/O ratio will be measured.

Functionalized and unfunctionalized G and GO oxide flakes will be used.

The samples will be prepared and despatched to each participating laboratory by the project leader.

International Participation

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

Deliverables and Dissemination

- Development of measurement methods for the main elemental analysis, oxygen content and C/O ratio in G and GO flakes.
- Publications in peer-reviewed scientific journals.

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