



# Graphene and Related 2D Materials

## Technical Work Area 41

## Call for Participation

### Project 6

### Specific surface area (SSA) determination of a powder containing graphene flakes using Brunauer-Emmett-Teller (BET) method

#### Objectives

- This project aims to validate the methodology for measuring the specific surface area (SSA) of a powder containing graphene flakes using the Brunauer-Emmett-Teller (BET) method.
- The uncertainties associated with the sample, preparation, measurement and data analysis will be explored.

#### Background

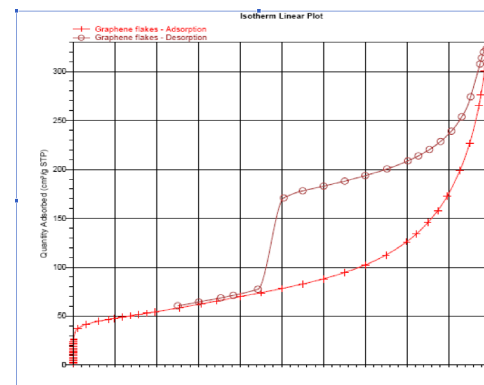
Graphene has attracted enormous attention due to its unique properties. The SSA of a powder containing graphene flakes is a significant parameter, especially for applications such as energy storage. However, reliable SSA values can be difficult to obtain for powders containing graphene flakes using the BET measurement method. This may be because commercially-available graphene is fabricated through multiple production routes and therefore exhibits different forms

which have distinct differences in microstructure, including defects and porosity. Other issues are around the adsorption gas, selection of the BET curve, and analysis of measurement data.

#### Standardization Needs

As industry uptake of 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 and IEC TC 113, focusing on the measurement of key physicochemical or electrical properties of graphene. Measurement of the SSA of graphene is an urgent need as a key physical property.



#### Work Programme

Samples will be sourced from industrial collaborators. The specific surface area and pore size distribution will be measured. Different kinds of graphene flakes with different microstructure will be used. The samples will be prepared and delivered to each participating laboratory by the project leader.

#### International Participation

Current participation includes volunteers from Australia, Brazil, China, UK, Korea, Japan and USA. More participants are welcome.

#### Funding

Participants will fund their own involvement in the project.

#### Deliverables and Dissemination

- VAMAS Technical Report
- Publications in peer-reviewed scientific journals
- This study will be used to aid development of standards within ISO TC229 'Nanotechnologies'.

#### Project Status

Call for international participants.

#### For more information on participation, please contact:

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