

Joint Project: Technical Work Areas 41/16 and 43/6

In-plane thermal diffusivity measurements of graphene and related 2D material films

Objectives

This project aims to test a protocol for flash method measurement of the in-plane thermal diffusivity of graphene and related 2D materials (GR2M) films. Results will be used to validate interlaboratory reproducibility and to determine uncertainties associated with the measurement and data analysis.

Background

Due to their ultra-high thermal conductivity, flexibility, light weight, and low-cost, GR2M films are under development or applied worldwide for thermal management in various applications including micro-electronics, integrated circuits, communications, and new energy vehicles. The primary material property for performance evaluation towards such applications is the in-plane thermal diffusivity.

The flash method is considered to be effective for thermal diffusivity measurements of GR2M films, and, as such, is a widespread technique. However, no validated method is available as an international standard, and the degree of interlaboratory

variation using a single measurement protocol, arising from sample preparation, test conditions and/or instrument calibration, has not been evaluated.

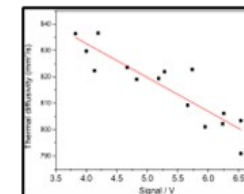
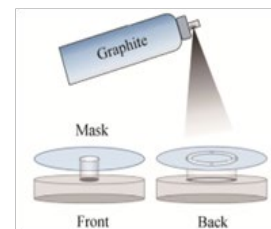
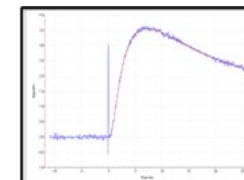
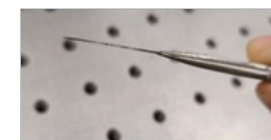
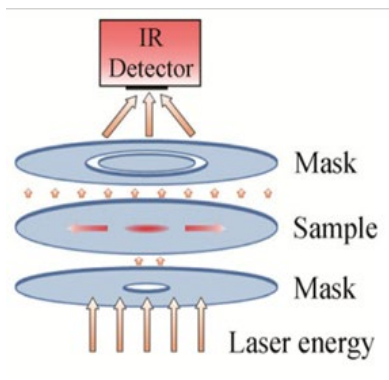
Standardization Needs

There are no internationally recognized standards at present for in-plane thermal diffusivity measurement of GR2M films using the flash method. Accurate and reproducible measurement methods are important to maintain quality in manufacturing and promote international commerce as there are multiple production routes and suppliers of GR2M materials. Data from this effort will be used to inform potential international standardization.

Work Programme

Participants are expected to conduct thermal diffusivity measurements of GR2M films by the flash method using a provided data analysis method. Flexible GR2M films will be centrally prepared and screened for flatness before shipping to participants. Several samples may be provided. Measurements are to be based on the protocol, and both analysed and raw data will be collected.

Call for Participation



Deliverables and Dissemination

Results will be included in a VAMAS technical report and in an anticipated scientific journal publication. They may also inform international standardization efforts in ISO TC 229.

International Participation

Current participation includes institutes from Australia, Asia and Europe. More participants are welcome.

Funding

Participants fund their own involvement in the project.

Project Status

The project is seeking additional participants. Completion is expected in 2026.

For more information:

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