VAMAS

Raman Spectroscopy and Microscopy
Technical Work Area 42

CALL FOR PARTICIPATION

Project 3

Measurement of Lateral and Axial Resolution of Raman Microscope

Objectives

The project is to provide standard definition and procedure of measuring the spatial (lateral, axial) resolutions of Raman microscope by using dispersed CNTs and suspended graphene.

Background

Raman microscope is usually built on an optical microscope and integrated with laser input and spectrometer output. The laser focus is scanned on the sample and the scanning image is obtained with the pixels representing full spectra. By integrating the certain spectral range of the spectrum at each pixel, Raman image at certain Raman bands can be generated.

The ideal method for measurement of spatial resolution, lateral or axial, is the direct imaging of point spread function (PSF) and this can be achieved by imaging a small object of which the size is zero or negligible compared to the size of PSF. For this purpose, this protocol describes two different standard specimens for measurements of the lateral resolution and the axial resolution

Standardization Needs

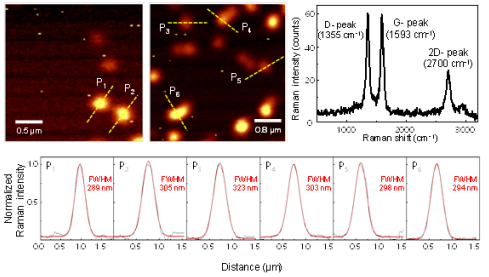
Spatial resolution is one of the main specifications of Raman microscope. However the definition and the measurement procedures largely vary depending on the manufacturers of the systems. The general assessment of the spatial resolution has therefore been limited. In this study, we provide a standardized protocol that describes the measurement of the spatial resolution of a Raman microscope by performing simple measurements using standard specimens that can be easily prepared.

Work Programme

- Development of standard specimens suitable for the reliable assessment of spatial resolution.
- Development of a protocol for the measurement of the standard specimens.
- Development of a standard procedure to analyze the measurement results.

Duration

One year beginning January 2019.



Extraction of a line profile from a Raman image of

Deliverables and Dissemination

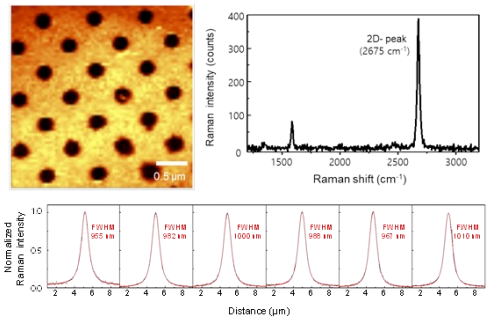
Documentary and physical standards will be presented in ISO TC 201 meeting and scientific journals.

Funding

Participants fund their own involvement. Each participant may need up to 5 days' effort to complete the exercise.

References

- ISO 18516: Surface chemical analysis – Auger electron spectroscopy and X-ray photoelectron spectroscopy and spectroscopy – Determination of lateral resolution;
- G. Wilkenig and L. Koenders, Nanoscale calibration standards and methods, Ch. 21 (2005) Wiley-VCH



Axial line profile of 2D Raman band of suspended graphene layer

International Participation

Current participants represent Canada, Italy, Japan, Korea, Mexico and the USA. More volunteers welcome.

For more information on participation, please contact:

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January 2019