Raman characterization of graphene grown by CVD and subsequently transferred on various substrates

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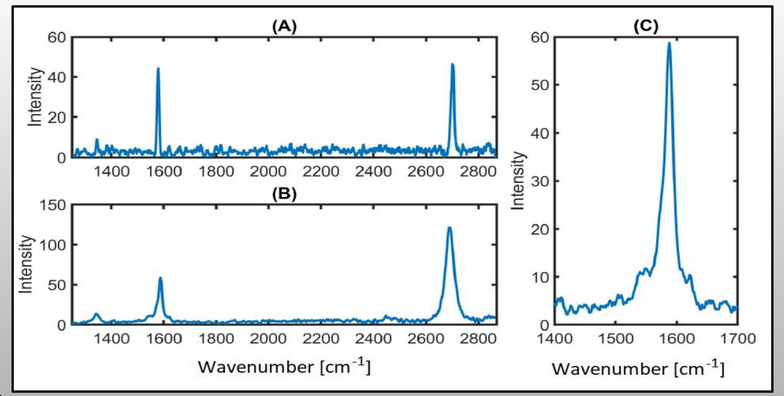
Motivation

- Graphene growth by CVD and transfer by various methods. In order to achieve monolayer or bilayer graphene structures for future technological applications.
- Analysis based on the characteristics of the Raman spectrum in order to determine the configuration of the graphene obtained [1].

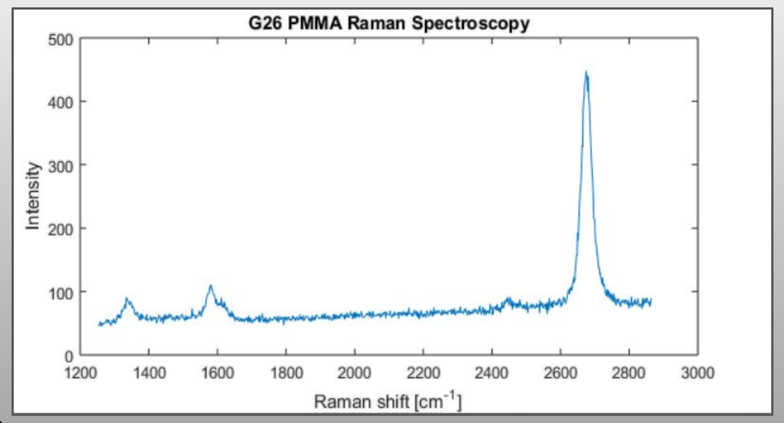
Results

Biphase transfer method - Sample G23



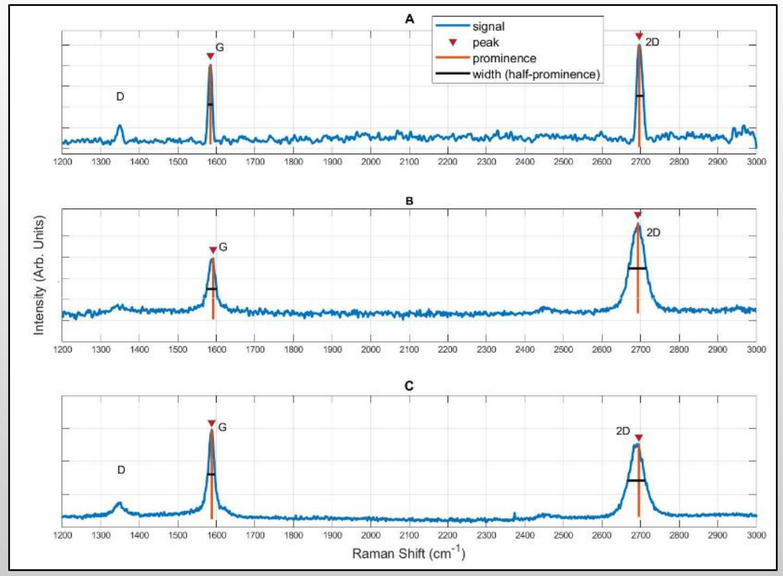
- The transfer by the biphasic method gave good results in terms of the ratio of intensities and conservation of various characteristics.
- Quantum results I_{2D}/I_G .
- For a particular sample, the possible presence of a carbon nanotube was obtained [2].
- Obtaining possible monolayer (B) and bilayer (A) graphene.

PMAA transfer method - Sample G26



- Result of I_{2D}/I_G ~ 4, being able to associate with a graphene monolayer.
- Damaged lattice, due to an irregular cell structure and presence of defects generated during the graphene growth.

PMMA transfer method - Sample G22



- We suspect that the sample consists mainly of monolayers and bilayers of graphene, due to high symmetry on the 2D peak and I_{2D}/I_G ratio.
- The crystal lattice suffered little to none damage during the transfer process.

Conclusion

For both samples G22 and G26, after the PMMA process, measurements compatible with a monolayer were obtained. On the other hand, using the biphase method, remarkable properties were achieved. We were able to determine that in both cases good results were obtained with graphene transfer. For each of the samples, unique characteristics emerged that could be useful for specific applications.

Reference

[1] Mark Wall, “The Raman Spectroscopy of Graphene and the Determination of Layer Thickness”, 2011, Thermo Fisher Scientific.
[2] Andrea C. Ferrari and Denis M. Basko, “Raman spectroscopy as a versatile tool for studying the properties of graphene”, 2013.