

2D materials: transfer for microelectronic devices

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2D materials present a large range of electrical properties from insulator to conductor but also semiconductor or semi-metal moreover, their flexible, transparency and small dimension make them attractive for new electronic devices [1]. However, transfer of 2D materials for electronic devices is a challenge at several levels:

- Transfer on heterogeneous substrates composed with metal, SiO₂, SiN...
- Transfer on substrates with topography: electrodes, cavities...
- Cleaning of interfaces
- CMOS-compatible process (contamination, clean room...)
- Integration in devices: deposition on top layers, patterning...
- Large scale transfer

In our work, we study the transfer of 2D materials for microelectronics devices. We develop several large-scale transfer methods compatible with clean room. We also work on the transfer on electrodes with a high topography (>100 nm) and on the patterning, cleaning of interfaces and integration. Most of results have been obtain with MoS₂ and graphene but we also studied the transfer of other 2D materials.

References

- [1] C. Tan, X. Cao, X-J Wu, Q. He, J. Yang; X. Zhang... H. Zhan Chem. Rev. (2017) 117, 6225-6331
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Figures

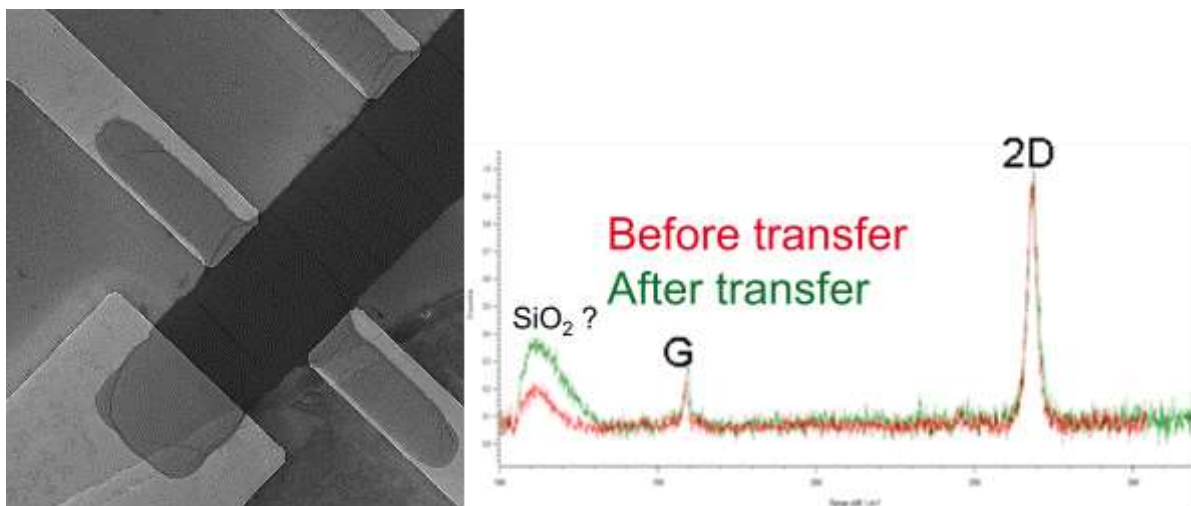


Figure 1: MoS₂ on devices (left), Raman spectra of graphene before and after transfer