

## Graphene on semi-insulating 4-inch SiC

### **Description:**

- Graphene grown on 4-inch Si-face of semi-insulating silicon carbide (SiC)
- Growth method: Thermal sublimation.
- Analysis: AFM, Optical microscopy and Raman measurements <sup>[1]</sup>
- Coverage: >95%
- Monolayer graphene: >60% <sup>[2]</sup>
- Comments: Transparent. C-face laser marked
- Conductivity type: n-type
- Carrier concentration:  $5 \times 10^{11}$  -  $5.0 \times 10^{12}$  <sup>[3]</sup>
- Hall electron mobility (room temperature): up to  $3000 \text{ cm}^2 \text{V}^{-1} \text{s}^{-1}$  <sup>[3]</sup>

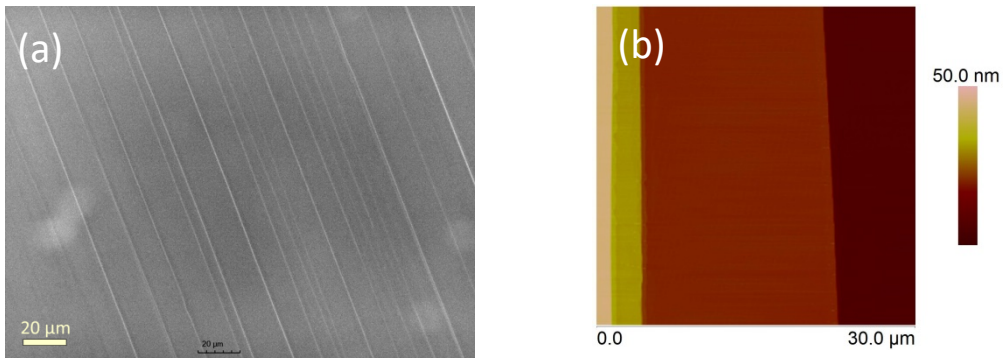
### **SiC substrate:**

- Type: Semi-insulating SiC
- Polytype: 4H
- Orientation: (0001)  $\pm$  0.2 deg
- Thickness:  $500 \pm 25 \text{ }\mu\text{m}$
- Resistivity:  $>1 \text{E}+7 \text{ }\Omega \cdot \text{cm}$
- Micropipe density:  $<5 \text{ cm}^{-2}$
- Primary flat orientation:  $\langle 11\text{-}20 \rangle$
- Secondary flat orientation:  $\langle 1\text{-}100 \rangle$
- Additional: C-face laser marked. C-face etched after thermal sublimation

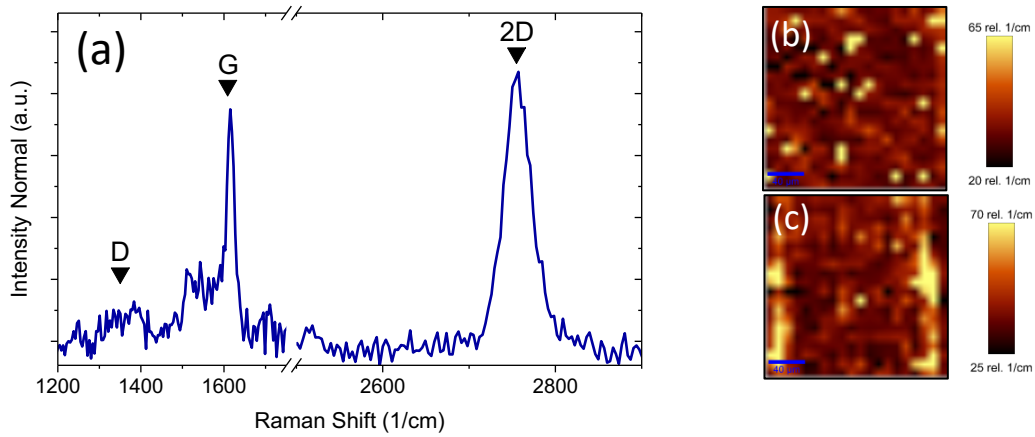
<sup>[1]</sup> Optical microscopy: >30 regions inspected. AFM: 7 regions inspected. Raman: 7 regions inspected.

<sup>[2]</sup> Monolayer percentage is calculated via 2D Raman mappings, using the [Code of Good Practice](#) of the Spanish Graphene Alliance.

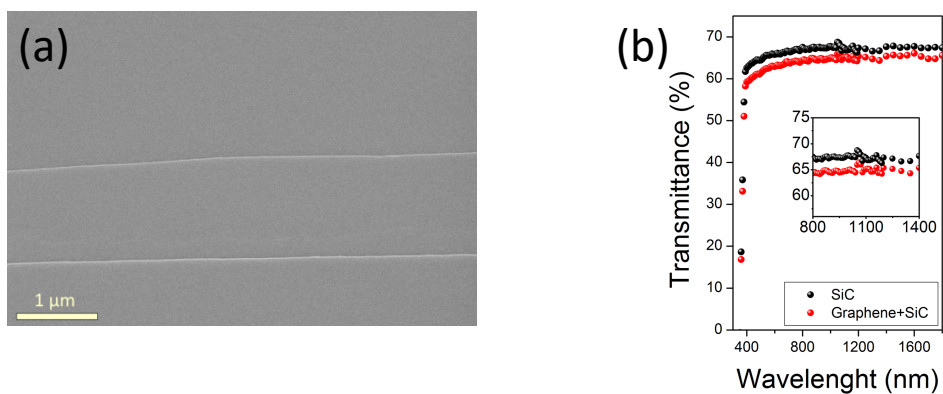
<sup>[3]</sup> Values obtained on Hall bars patterned on top of a terrace via electron beam lithography on  $8 \times 8 \text{ mm}^2$  samples.



**Fig. 1:** (a) Optical image showing a top-view of the terraces of the surface and (b) atomic force microscopy leveled image.



**Fig. 2:** (a) Raman spectroscopy single measurement where representative peaks of graphene are evidenced, and [(b) and (c)] 200x200 μm<sup>2</sup> sized 2D-mappings of the FWHM of the 2D peak, collected over two areas of the same wafer.



**Fig. 3:** (a) SEM image of epitaxial graphene grown on SiC, and (b) transmittance of SiC wafer and SiC wafer after graphene growth.