Contribution (Invited)

Synthesis of epitaxial graphene on SiC for electronic applications

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Decomposition of silicon carbide (SiC) at high temperatures [1] is an effective route to synthesize wafer-scale single-crystal graphene [2]. The underlying process in the surface graphitization of SiC is the preferential sublimation of Si atoms at high temperature (T), typically above T=1500ºC. Graphene nucleation, coupling with the buffer layer and morphology are strongly influenced by the experimental conditions and the intrinsic properties of the substrates, such as polar face, quality, miscut angle and doping. In this talk we will summarize several of our recent results for producing graphene on SiC based on previous research [2, 3]. Furthermore, we will present technological solutions such as ion implantation (see Figure 1) for bottom gating, opening new avenues towards the fabrication of graphene-based devices.

Figures

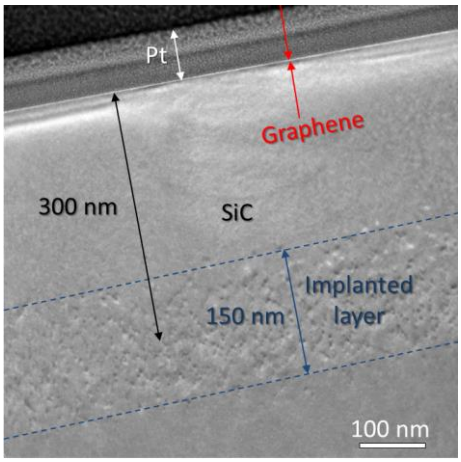

Figure 1: Cross-sectional transmission electron microscopy micrograph of a selected SiC sample covered with graphene, showing a buried conductive layer fabricated via ion (nitrogen) implantation.

References

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