

ISGD-5

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Recent progress in the epitaxial graphene formation on 3C-SiC/Si substrates

Maki Suemitsu

RIEC, Tohoku University

*E-Mail: suemitsu@riec.tohoku.ac.jp

Epitaxial graphene formation on 3C-SiC thin films pre-grown on Si substrates is reviewed.

By graphitizing the top few layers of 3C-SiC thin films heteroepitaxially grown on Si substrates, epitaxial graphene (EG) can be formed on Si wafers. Besides its good compatibility with the Si planar technology, this technology provides a way to control the interfacial (graphene/SiC) and the stacking (Bernal/non-Bernal), and even the electronic (metallic/ semiconducting) structures of EG by simply tuning the crystallographic orientation of the Si substrate used in the process. Microfabrication of Si wafers, which is not easy on SiC wafers, can also be utilized for this orientation tuning. Insertion of AlN layer in between the 3C-SiC thin film and the Si substrate is also beneficial in that it acts as a good buffer layer for SiC formation as well as a good diffusion barrier against Si atoms during the high temperature graphitization annealing. Recent observation on the charge states at the EG/SiC interface will also be addressed.

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