SST-004

Study on Defects in 2D Materials using Atomic Resolution TEM

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The unique properties of 2D materials significantly rely on the atomic structure and defects. Thus study at atomic scale is crucial for in-depth understanding of 2D materials and provides insights into its future applications. Using aberration-corrected transmission electron microscopes, atomic resolution imaging of individual atoms has been achieved even at a low kV. Ongoing optimization of aberration correction improves the spatial resolution better than angstrom and moreover boosts the contrast of light atoms. I present the recent progress of the study on the atomic structure and defects of monolayer and multilayer graphene, hBN and MoS2. Furthermore, the defect formation mechanisms of graphene, hexagonal boron nitride and MoS2 are discussed.

Keywords: 2D Materials, TEM, Defects

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Tip Enhanced Nano Raman Scattering in Graphene

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As an era of nano science approaches, the understanding on the shape and optical properties of various materials in a nanoscale range is getting important more seriously than ever. Accordingly the development of high spatial-temporal-spectral resolution measurement tools for characterization of nanomaterials/structures is highly required. Generally, the various properties of sample can be measured independently, e.g. to observe the structural property of sample, we use the scanning electron microscopy or atomic force microscopy, and to observe optical property, we have to use another independent measurement tool such as photoluminescence spectroscopy or Raman spectroscopy. In the case of nano-materials, however, it is very difficult to find out the same position of sample at every different measurement processes, and the condition of sample can be changed by the influence of first measurement. The tip enhanced Raman scattering(TERS), which can simultaneously measure the two or more information of sample with nanoscale spatial resolution, is one of solutions of this problem. In this talk, I will present our recent nano Raman scattering data of graphene that measured by TERS and optimized tip fabrication method for efficient experiment.

Keywords: Raman scattering, graphene