NS/2DMD-09-1-I-W

Raman spectroscopy for surface scientific investigation of 2-dimensional crystals

Sunmin RYU*

Department of Chemistry and Division of Advanced Materials Science, POSTECH, Korea

sunryu@postech.ac.kr

Raman spectroscopy has proven to be a versatile analytical tool in graphene research because of the varying spectral features for different thickness, stacking, defect density, charge density (n), mechanical strain (ε), temperature, etc. Such multimodal sensitivity, however, turns into difficulty when multiple unknown variables are to be determined simultaneously. Despite the strain-sensitivity of the Raman G and 2D modes, for example, optical characterization of native strain in graphene on silica substrates has been hampered by excess charges interfering with both modes. In this talk, I will show that the effects of strain and charges in graphene can be optically separated from each other by correlation analysis of the two modes, enabling simple quantification of both. Additionally, the change in the electronic structure of graphene caused by the Van der Waals interaction with hexagonal boron nitride (hBN) substrates can also be optically determined. Employing the proposed analysis, I will address our recent findings on important surface scientific issues of graphene such as structural deformation caused by substrates and thermal perturbation, interfacial charge transfer, and molecular intercalation through graphene-substrate interface.