NT-P034

Strain-Modulated Photoluminescence in Single-Layer MoS_2

고택영, 박광희, 류순민

경희대학교 응용화학과

When MoS_2 is thinned to single layer (1L), photoluminescence (PL) quantum yield drastically increases due to emergence of direct band gap. A recent theory predicts that the electronic structure of 1L MoS_2 is very sensitive to its lattice constants. We investigated the response of 1L MoS_2 to biaxial tensile strain using spatially resolved PL and Raman spectroscopy. Changes in the lattice constants were monitored by the Raman frequency of the in-plane (E^1_{2g}) mode. Systematic correlations between PL and Ramanspectral features, revealed in the preliminary results, will be further tested with samples on other substrates and against thermal stress. The results will also be discussed in regard to the theory which predicts that 1L MoS_2 becomes an indirect semiconductor at small tensile strain and turns metallic when further extended.

Keywords: MoS_2, Photoluminescence, Raman, Strain