

Raman Spectroscopy and Imaging of Low Energy Phonons in 2D Crystals

Raman bands in the low energy region of the spectrum of crystals are attributed to so-called external lattice vibrational modes. The Raman bands from these low energy phonons are very sensitive to crystal structure and to chemical bond interactions within the crystal. Raman spectra and images of low energy phonons in so-called two dimensional (2D) crystals such as few-layer MoS₂ reveal spatial variations in the solid state structure that are not evident in the higher energy bands. We will discuss the sensitivity of low-energy phonons to the structure of 2D crystals, complementarity of reflected light and low-energy Raman imaging, and the probing of 2D layer orientation and stacking through the Raman band structure of low-energy phonons.

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