

Abstract:

This work deals with preparation and study of sandwich heterostructures of MoS₂ and graphene. MoS₂ layers prepared by mechanical exfoliation were detected by optical microscopy and characterized by Raman spectroscopy and atomic force microscopy (AFM). Spectroelectrochemical cells were created for sandwich heterostructures MoS₂/graphene and Raman and photoluminescence spectra were studied in dependence on applied electrical potential. Also spectroelectrochemical measurements were performed on mono- to four-layer MoS₂ in microdroplet.

Changes in the parameters of E_{2g}^1 (E') and A_{1g} (A_1') peaks in the Raman spectra and both direct and indirect photoluminescence transitions in the photoluminescence spectra of MoS₂ were observed in dependence on the applied voltage. Splitting of the indirect transition into two parts Γ^- and Γ^+ was observed during the measurement in the microdroplet.

Keywords: MoS₂, graphene, Raman, spectroscopy, spectroelectrochemistry