Investigation of multilayer MoS2 film grown by CVD method on transferred CVD graphene

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Two-dimensional semiconductors such as MoS2, WS2 are new family of materials with wide potential for applications in nano- and optoelectronics. Transition metal dichalcogenides (MoS2, WS2, WSe2, MoSe2) are a group of layered materials that can be separated into monolayers. The development and study of vertical Van der Waals heterostructures based on MoS2, WS2, and graphene is a promising task [1].

In this work we synthesize MoS2 by CVD method on transferred CVD graphene. First of all, CVD graphene was transferred on SiO2/Si substrates by PMMA assisted method. After that, sample with CVD graphene and ordinary SiO2/Si substrate were placed in furnace (Nabertherm RS 80/750/11). The MoS2 films were synthesized by annealing at 700C for 15 minutes in Ar flow.

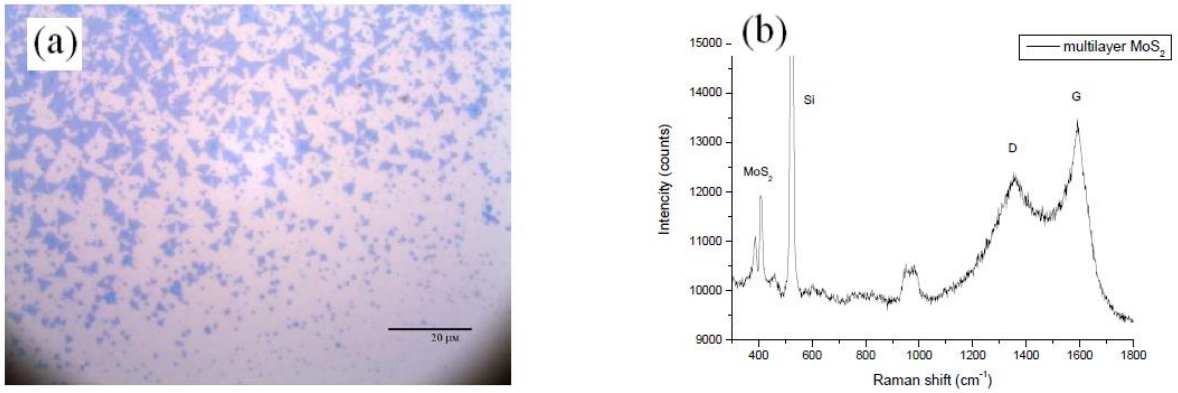

Fig.1. (a) Optical image of MoS2 on SiO2/Si substrate; (b) Raman spectra of multilayer MoS2 film grown on transferred CVD graphene.

In this work we present investigation of light effect on multilayer film of MoS2. There are two types of samples – with multilayer CVD graphene film on the surface of substrate and without. The first type of samples shows change in resistance under the influence of light, and there are no changes of the resistance in the second ones. Raman spectra of samples with CVD graphene showed weak carbon peaks even on area without graphene film, which can be connected with the transfer features. In samples with CVD graphene on it, we clearly saw the light influence on conductivity of MoS2 films. Developing of clean MoS2/graphene interface will be key for fabrication of optoelectronic devices.

Acknowledgement

The reported study was funded by RFBR according to the research project № 18-32-00730

References

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