**Nanocomposites and nanomaterials**

**Luminescent and electrophysical properties of MoS2 nanosheets and its composites with polymer and graphene**

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Cost effective electrically conductive materials with luminescent and photovoltaic properties are very attractive for manifold electronic applications such as light-emitting diodes, solar cells, sensors, etc.

Polymer based composite materials where polymer as a matrix and nanoplatelets as nanofiller with their positive qualities and bottlenecks are often used. Commonly, polymers have advantages such as easy synthesis and processing, chemical and structural diversity, low weight, and flexibility. Nanosized fillers results in an increased role of the interface between the components due to their large active surface. The properties of nanocomposite are known to be determined by the properties of the polymer, the filler and the interface between them. Magnetic nanoparticles can give magnetic properties to such composite, and to transform the morphology of this material.

In this talk luminescence and excitation spectra and decay kinetics of solution and thin films of MoS2 nanosheets synthesized by means of decomposition of single-source precursors, and their polymer composite are presented and analyzed. Morphological and electrophysical data for thin films of these materials are studied. It has been found that luminescence spectra depend on excitation wavelength, excitation spectra depend on registration wavelength, luminescence is blue, and decay times are higher than in previous studies. These data show the complicated mechanism of energy transformation in the system under study. Commonly, the behaviour of excitation and luminescence spectra in solutions and thin films is similar. The obtained composite shows photoconductivity properties. The possible applications of this material is discussed.