

# Emerging Trends in Materials Science and Nanotechnology

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## 2D molybdenum disulfide and its polymer composites - characterization and thermal properties

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**T**he discovery of graphene has aroused enormous scientific interests in fabrication and application of new two-dimensional (2D) materials in the past decade. As a typical layered graphene-like material, molybdenum disulfide (MoS<sub>2</sub>) shows the unique properties exhibiting great potential applications in the field of electronic and optoelectronic devices. Despite the enormous scientific interests aroused by MoS<sub>2</sub>, little attention has been focused on the progress in fabrication, properties, and applications of MoS<sub>2</sub>/polymer nanocomposites up to now. In this work, exfoliated molybdenum disulfide (MoS<sub>2</sub>) modified by a metal oxide (MoS<sub>2</sub>/MxO<sub>y</sub>) and carbon nanotubes (MoS<sub>2</sub>/CNT) was prepared and characterized by atomic force microscopy (AFM), Raman spectroscopy and transmission electron microscopy (TEM). The samples were used in polymer composite preparation by using an extruder blending method. Nanocomposites of polymer with nanofillers were obtained.

The morphology, thermal properties, fire resistant properties and thermal conductivity of the nanocomposites were studied. We observed good flame retardance for all composites. All composites with exfoliated MoS<sub>2</sub> exhibit greater potential for preparation of smart and functional nanomaterials with good thermal and fire resistant properties.

### Biography

Karolina Wenelska has completed her PhD from West Pomeranian University of Technology. She is a Professor Assistant in Nanomaterials Physicochemistry Department. She has published 15 papers in reputed journals and she is an Author of 3 patents. She works with functional nanomaterials that can be used in various fields such as flame retardancy, supercapacitors or Li-ion batteries.

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