**Nanocomposites and nanomaterials**

**Intramolecular structure and conductivity of polyethylene glycol film polymer composites with carbon nanotubes**

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PEG are water soluble synthetic polymer. These materials have a wide range of applications, including use in pharmaceutical experiments, food additives and plasticizers. PEG is considered as one of the most important polymers due to it has exhibited interesting behaviors and properties such as it is commercial, non expensive, non-toxic and non-corrosive polymer. The modification of the PEG polymeric matrix with carbon nanotubes (MWCNT) certainly affects the intrinsic molecular structure and properties of polymer composites. However, the structure of the PEG polymeric matrix, its modification by different π-coupled systems has not been investigated.

The commercially available poly(ethylene glycol) [PEG-4000] has been used and doped with multiwalled carbon nanotubes (0-1,0 wt.%). The films of pure PEG and its composites with MWCNT were synthesized by the «Doctor blade coating method». In this work the crystal structure, optical absorption spectra, IR spectra, photoluminescence and concentration dependence of electrical conductivity were investigated.

 It is shown that for nanocomposites PEG /MWCNT the electrical characteristics are nonmonotonic. There is a change in the intramolecular structure, and the reorganization of the C–C–O bonds in the IR spectra and the changes of emission centers in the photoluminescence spectra.