

Polymerization of Protonic Polyaniline/Multi-Walled Carbon Nanotubes/Manganese Dioxide Nanocomposites

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Abstract: *This study reports the synthesis and characterization of a ternary nanocomposite of polyaniline (PANI), multi-walled carbon nanotubes (MWCNTs) and manganese dioxide (MnO₂). MnO₂ successfully filled the cavities between the MWCNTs. In situ polymerization of aniline in the presence of MWCNTs-MnO₂ was done to form a ternary nanocomposite. The ultraviolet-visible (UV-vis) spectrum shows that MnO₂ filling does not significantly change the electronic transition of the nanocomposite. The infrared (IR) spectrum shows that the nanocomposite is rich in quinoid rings of PANI. Electron microscopy reveals the MnO₂ filling and coating of PANI. The ternary nanocomposite showed high electron conductivity compared to neat PANI and PANI/MWCNTs without MnO₂.*

Keywords: conducting polymer, polyaniline, multi-walled carbon nanotubes, manganese dioxide, nanocomposites