

# SYNTHESIS OF POLYANILINE/GRAPHENE NANOCOMPOSITE AND ITS THERMAL, OPTICAL AND ELECTROCHEMICAL PROPERTIES

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Recently, nanocomposites based on conducting polymers and graphene have attracted a great interest of the scientists due to its potential applications in various fields such as sensors, catalysis, capacitors, displays. Among all the conducting polymers, Polyaniline (PANI) is one of the most intriguing materials owing to its easy method of preparation and its high stability on environmental exposition. On the other hand, Graphene nanosheets exhibit very high electrical conductivity due to their very high electron mobility.

The nanocomposites were prepared by using electrochemical synthesis of conductive polymer matrix, Polyaniline-PANI and modified and unmodified Graphene. Two types of nanocomposites were synthesized: I st with graphene deposited on the Pt-electrode and II nd with graphene dispersed in the electrolyte. Characterization was performed by several techniques: FTIR, UV-VIS, TGA/DTA, Raman, SEM, TEM and electrical measurements by resistivity and cyclic voltammetry.

The morphological study of the modified Graphene based NC showed porous fibrillar morphology, Graphene structure is well included in PANI matrix. Compared to neat PANI, CV curves in the presence of MWCNT have shown remarkable higher anodic and cathode peaks. The obtained composites exhibited a higher value of conductivity which may be attributed to the synergy effect of the conductive polymer matrix and graphene nanostructure.