

Chemical Synthesis, Electrical and Antibacterial Properties of Polyaniline/Gold Nanocomposites

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Abstract : Polyaniline/gold (PANI/Au) nanocomposite was prepared by in-situ chemical oxidation polymerization method. The synthesis involved the formation of polyaniline-gold nanocomposite, by in-situ redox reaction and the dispersion of gold nano particles throughout the polyaniline matrix. The nanocomposites were characterized by XRD, FTIR, TEM and UV-visible spectroscopy. The characteristic peaks in FTIR and UV-visible spectra confirmed the expected structure of polymer as reported in the literature. Further, transmission electron microscopy (TEM) confirmed the formation of gold nano particles. The crystallite size of 30 nm for nanoAu was supported by the XRD pattern. Further, the A.C. conductivity, dielectric constant ($\epsilon'(w)$) and dielectric loss ($\epsilon''(w)$) of PANI/Au nano composite was measured using impedance analyzer. The effect of doping on the conductivity was investigated. The antibacterial activity was examined for this nano composite and it was observed that PANI/Au nanocomposite could be used as an antibacterial agent.

Keywords : AC-conductivity, anti-microbial activity, dielectric constant, dielectric loss, polyaniline/gold (PANI/AU) nanocomposite

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