

## Polymer-Nanographite Nanocomposites for Biosensor Applications

**Authors :** Payal Mazumdar, Sunita Rattan, Monalisa Mukherjee

**Abstract :** Polymer nanocomposites are a special class of materials having unique properties and wide application in diverse areas such as EMI shielding, sensors, photovoltaic cells, membrane separation properties, drug delivery etc. Recently the nanocomposites are being investigated for their use in biomedical fields as biosensors. Though nanocomposites with carbon nanoparticles have received worldwide attention in the past few years, comparatively less work has been done on nanographite although it has in-plane electrical, thermal and mechanical properties comparable to that of carbon nanotubes. The main challenge in the fabrication of these nanocomposites lies in the establishment of homogeneous dispersion of nanographite in polymer matrix. In the present work, attempts have been made to synthesize the nanocomposites of polystyrene and nanographite using click chemistry. The polymer and the nanographite are functionalized prior to the formation of nanocomposites. The polymer, polystyrene, was functionalized with alkyne moiety and nanographite with azide moiety. The fabricating of the nanocomposites was accomplished through click chemistry using Cu (I)-catalyzed Huisgen dipolar cycloaddition. The functionalization of filler and polymer was confirmed by NMR and FTIR. The nanocomposites formed by the click chemistry exhibit better electrical properties and the sensors are evaluated for their application as biosensors.

**Keywords :** nanocomposites, click chemistry, nanographite, biosensor

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