MORPHOLOGY AND ELECTRICAL CONDUCTIVITY OF ELECTROSPUN EXPANDED POLYSTYRENE(EPS) /REDUCED GRAPHENE OXIDE COMPOSITE

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ABSTRACT

Conductive polymer composite due to their unique properties and potential in various applications including chemical and bio sensors is receiving a lot of research attention in recent times. In this work a highly conducting reduced graphene oxide (rGO) was incorporated into the matrix of expanded polystyrene; a recycled polymer, and the solution was electrospun under the effect of various processing parameters. A filler loading of between 0.02- 0.20 volume fraction was used at 10%w/v concentration of EPS. The effect of increasing polymer concentration and the influence of mixing time on morphology and electrical conductivity were investigated. Analytical tools such as SEM-EDX, XRD, and FTIR were used to study the morphology of the synthesized rGO and electrospun nanofibers and four-point probe was used for electrical characterization. A significant enhancement of conductivity was observed when compared with EPS/ carbon black composite.

Keywords: Composite, filler loading, enhancement, carbon black, conductivity