

Synthesis and morphological study of graphenated carbon nanotube aerogel from grapeseed oil

ABSTRACT

Grapeseed oil as a new source of graphenated carbon nanotube (g-CNTs) hybrids was described in this paper. Mesoporous three-dimensional (3D) g-CNT aerogel was synthesized by a floating catalyst chemical vapor deposition (FCCVD) method. The effect of the H₂ gas ratio was evaluated, and the graphenated g-CNTs morphology was identified by various physico-chemical techniques, such as field-emission scanning microscopy (FESEM), high-resolution transmission electron microscopy (HRTEM), Raman spectroscopy, thermogravimetric analysis (TGA), and N₂ sorption studies. Furthermore, the multi-wall carbon nanotube (MWCNT) bundles in the network were highly disordered and rounded by graphene foliate structures in which a large number of sharp edges of graphene sheets were found.

Keyword: Grapeseed oil; Floating catalyst chemical vapor deposition; Hydrogen flow rate; Graphenated carbon nanotubes