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Preparation and characterization of poly(vinyl alcohol)/graphene composite nanofibers via electrospinning

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Abstract content
 (Max 300 words)
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We report on the synthesis and characterization of electrospun polyvinyl alcohol (PVA)/graphene nanofibers. The samples produced were characterized by Raman spectroscopy for spectroscopy for composition, scanning electron microscopy (SEM) for surface morphology and Thermogravimetric analysis (TGA) for thermal properties. SEM measurements clearly show uniform fiber formation and excellent graphene dispersion within the fibers, while TGA measurements show the improved thermal stability of PVA in the presence of graphene. The synthesized polymer reinforced nano-fibers have potential to serve in many different applications such as thermal management, electrodes and biomedical materials for drug delivery. We successfully incorporated graphene nanofillers into PVA fibers in order to improve the thermal properties of the resulting fibers. Three different source of graphene were used for that purpose and all show improved thermal properties of the fibers after incorporation of the graphene nanofillers. The relatively simple and economical electrospinning technique was used to fabricate continuous fibers. The growth of the PVA fibers was optimized for this system in term of bead free fibers and thinner fibers. It was realized that the fibers synthesized were hollow. The results show a slow weight loss, meaning enhanced thermal stability of the fibers with increasing graphene loading into the PVA fibers.

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Yes

Level for award (Hons, MSc, PhD)?

MSc

Main supervisor (name and email) and his / her institution

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Would you like to submit a short paper for the Conference Proceedings (Yes / No)?

Yes

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