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Facile fabrication of graphene nanoribbon/silicone rubber elastomer for strain sensing

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The graphene and its derivatives have received intense interest in the last few decades due to its unique structure and excellent properties. As a newly-emerged candidate of the graphene family, the graphene nanoribbon (GNR) showed great promise in composite applications. In this work, we prepared the GNR through unzipping the carbon nanotubes and incorporated it in fabricating the silicone rubber (SR) elastomer. The electrical properties of the fabricated GNR/SR nanocomposites were studied afterwards. The results showed that with the help of an ionic liquid, 1-butyl-3-methylimidazolium chloride, the GNR dispersed very well in the SR. The prepared GNR/SR elastomer with the GNR loading of 12 wt% had very excellent mechanical strength compared to the pure SR. The resistance of the prepared GNR/SR elastomer had a nearly linear dependence to the applied strain when the strain was below 50%. The elastomer has potential to be used as the conductive elastomer or the strain sensor.

Biography

Shang Songmin graduated from The Hong Kong Polytechnic University with a PhD in 1997. He has been active in both the academic world and the industry for the last 20 years. The main interesting fields of his scientific research are on the science and engineering of new materials, nanomaterials, composites, biomaterials, novel textiles technology, eco and low carbon dyeing technology, sustainable dyeing-finishing technology, etc. He has published more than 100 SCI, EI, professional journal papers and conference.

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