

Flexible Poly(vinylidene fluoride-co-hexafluoropropylene) Nanocomposites Filled with Ternary Nanofillers for Energy Harvesting

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Abstract : Integrating efficient energy harvesting materials into soft, flexible and eco-friendly substrates could yield significant breakthroughs in wearable and flexible electronics. Here we present a tri phasic filler combination of one-dimensional titanium dioxide nanotubes, two-dimensional reduced graphene oxide, and three-dimensional strontium titanate, introduced into a semi crystalline polymer, Poly(vinylidene fluoride-co-hexafluoropropylene). Simple mixing method is adopted for the composite fabrication after ensuring a high interaction among the various fillers. The films prepared were mainly tested for the piezoelectric responses and the mechanical stretchability. The results show that the piezoelectric constant has increased while changing the total filler concentration. We propose an integration of these materials in fabricating energy conversion devices useful in flexible and wearable electronics.

Keywords : dielectric property, hydrothermal growth, piezoelectricity, polymer nanocomposites

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