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# Enhancing the Piezoelectric, Thermal, and Structural Properties of the PVDF-HFP/PZT/GO Composite for Improved Mechanical Energy Harvesting

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**Abstract :** Piezoelectric materials provide a promising renewable energy source by converting mechanical energy into electrical energy through pressure and vibration. This study focuses on improving the conversion performance of poly (vinylidene fluoride-co-hexafluoropropylene) (PVDF-HFP) by incorporating graphene oxide (GO) and lead zirconate titanate (PZT). The dispersion of PZT and GO within the PVDF-HFP matrix was found to be homogeneous, resulting in high piezoelectric performance with an increase in the β-phase content. The thermal stability of the PVDF-HFP polymer also improved with the addition of PZT/GO. However, as the percentage of PZT/GO increased, the young's modulus of the composite decreased significantly. The developed composite demonstrated promising performance as a potential candidate for energy harvesting applications.

**Keywords :** energy harvesting, mechanical conversion, piezoelectric composite, solvent casting method
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