

Preparation and electrostrictive properties of polyurethane filled with polypyrrole-carbon black for the energy harvesting application

The polymer composites based on the electrostrictive materials with high polarization are attracting scientific due to the prospect of application in the energy conversion. The dielectric and electrostrictive properties of polyurethane (PU) thin films filled with Polypyrrole-Carbon Black (PPy-CB) at different concentrations were investigated. All samples were prepared by using a film-casting process. The results were showed that dielectric constant, loss tangent and conductivity of PU/PPy-CB film composites increased when concentration of PPy-CB was increased. The dielectric behaviors of those samples was compared with several model for matching performance. Moreover, the electrostrictive coefficient also increased when concentration of PPy-CB was increased. While, the electrical breakdown stretch decreased when concentration of PPy-CB was increased which will be discussed for the energy harvesting applications.

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