

Electrostriction is the property of dielectrics which causes them to change their shape under application of an electric field. Electrostrictive materials are very promising for large induced strain actuators. We report on new mixtures of high dielectric constant nanoparticles and electrostrictive poly(vinylidene fluoride-trifluoroethylene-1,1-chlorofluoroethylene) – P(VDF-TrFE-CFE) terpolymer for thin film actuator applications. Mixtures containing the terpolymer and BaTiO₃ nanoparticles, respectively TiO₂ nanoparticles, in different weight fractions were used to prepare thin films. Measurements of the electric-field induced strain in the films, which was carried out using an interferometric method, show that the strain has been enhanced in the mixtures. The obtained increase in strain could be explained by a change in the dielectric constant of the mixtures as compared to the neat terpolymer. Indeed, the measurements using impedance spectroscopy reveal that the mixtures have higher dielectric constant than the neat terpolymer. In particular, the measurements for the composite with 1 wt% BaTiO₃ nanoparticles show a 15% increase in the dielectric constant, which in turn means a 3.5 times increase in the induced strain.