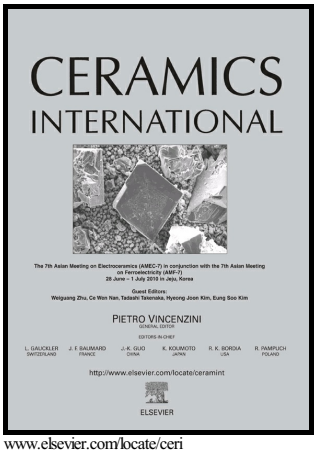

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Abstract

Integration of the excellent attributes of high dielectric constant and low dielectric loss in flexible polymer-based nanocomposites has attracted increased research attention because of their extensive applications in modern electronic and electric industry. In this study, to obtain the optimized dielectric constant and loss, the fabrication and properties of a three-phase nanocomposites, including poly(vinylidene fluoride) (PVDF) and two nanofillers, namely, surface-modified multi-wall carbon nanotubes (mCNTs) and barium titanate nanoparticles (mBTs), are investigated in detail. The mCNTs and mBTs were obtained via the hydrolysis of 3-aminopropyltriethoxysilane (AMEO) and condensation reactions between the AMEO and nanofillers. The three-phase nanocomposites are fabricated by a phase-separation and hot-pressing process. The mCNTs and mBTs can be uniformly dispersed within the PVDF polymer matrix because of the enhanced hydrogen bonding interaction and compatibility with the polymer matrix. The percolation