

Enhanced dielectric properties of PVDF/CaCu₃Ti₄O₁₂:Ag composite films

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© 2017 Elsevier B.V. Studies on free standing flexible composite films of Polyvinylidene fluoride (PVDF) incorporated with CaCu₃Ti₄O₁₂ (CCTO) functionalized by silver (Ag) nanoparticles (PVDF/CCTO:Ag) are presented here. CCTO nanoparticles were prepared by the sol-gel technique and thereafter covered with Ag nanoparticles by a modified seeding method. PVDF polymer filled with CCTO:Ag exhibited a higher dielectric constant (about 20% increment) and lower loss than PVDF polymer filled with pure CCTO at the same vol% of filler concentration. Transmission electron microscopy (TEM) studies revealed the size of the CCTO and of the Ag nanoparticles on the surface of CCTO. Differential scanning calorimetry (DSC) studies showed that both melting temperature and melting enthalpy were lower for PVDF/CCTO:Ag than for PVDF/CCTO with the same vol% of filler concentration.