

Lead Free BNT-BKT-BMgT-CoFe₂O₄ Magnetoelectric Nanoparticulate Composite Thin Films Prepared by Chemical Solution Deposition Method

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Abstract : Lead free magnetoelectric (ME) nanoparticulate (1-x) BNT-BKT-BMgT-x CFO (x = 0, 0.1, 0.2, 0.3) composite films were synthesized using chemical solution deposition method. The X-ray diffraction and transmission electron microscope (TEM) reveal that CFO nanoparticles were well distributed in the matrix of BNT-BKT-BMgT. The nanocomposite films exhibit both good magnetic and ferroelectric properties at room temperature (R-T). It is concluded that the modulation in compositions of piezomagnetic/piezoelectric components plays a fundamental role in the magnetoelectric coupling in these nanoparticulate composite films. These ME composites provide a great opportunity as potential lead-free systems for ME devices.

Keywords : lead free multiferroic, nanocomposite, ferroelectric, ferromagnetic and magneto-electric properties

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