

PHASE SWITCHING PHENOMENON AND MAGNETOELECTRIC EFFECT IN POLYVINYLIDENE FLUORIDE β PHASE THIN FILMS: EXPERIMENTS AND MODELING

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ABSTRACT. The magnetoelectric ME materials has dielectric polarization induced by the magnetic field or induced magnetization under an electric field. A strong ME effect requires the simultaneous presence of magnetic moments and electric dipoles. In the last decades, extensive research has been conducted on the magnetoelectric (ME) effect in single phase and composite materials.

This article reported the results obtained with two samples, the first is mono layer of PVDF bi-stretched and the second is the multi layer PVDF bi-stretched with the Polyurethane filled with micro particles magnetic Fe_3O_4 (PU+2% Fe_3O_4). Compare with non ME material like Alumine, a large ME polarization coefficient for the two samples was obtained. The piezoelectric properties of the PVDF and elastic proprieties of Pu+2% Fe_3O_4 give a big linear ME coefficient of the multi layer PVDF/(Pu+2% Fe_3O_4) than in the monolayer of PVDF.

KEYWORDS: *magnetoelectric effect, polymers, magnetic particles, composites, films.*