

## EFFECT OF THE ZNO STAR-LIKE PARTICLES ON THE PHYSICAL PROPERTIES OF THE POLY(VINYLIDENE FLUORIDE) COMPOSITE FILMS

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**Summary:** Poly(vinylidene fluoride) PVDF is one of the important polymers with versatile properties which attracted the researchers due to its piezoelectric and pyroelectric behaviour. Such properties can be effectively applied in various applications such as transducers, actuators or energy harvesters. ZnO particles are also very attractive additives, due to the facile fabrication of various morphologies, with wide potential applications i.e. energy harvesting or antibacterial activity enabling their composites to be applied in medical applications.

This study is aimed to investigate the effect of zinc oxide (ZnO) star-like particles on the physical properties of PVDF composite films.

Preparation of star-like ZnO particles prepared by microwave-assisted synthesis was arranged. The typical ZnO crystalline structure was confirmed by XRD investigations and star-like morphology by SEM images. Such well-prepared and characterized particles were mixed with PVDF via solution mixing in DMF. The spin-coating technique was utilized to prepare the final ZnO/PVDF composite films. The prepared films have very uniform thickness distribution due to the use of spin-coating technique. Effect of the ZnO morphology and concentration on the crystallinity percentage, crystalline phases and decomposition temperature will be discussed. Their dielectric and mechanical properties will be explained and connected to their piezoelectric properties.

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