Fabrication of Flexible Piezoelectric Generator based on Li modified Potassium Sodium Niobate Ceramic and PVDF for Energy Harvesting Application

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**ABSTRACT**

Energy harvesting has received a lot of attention for powering low voltage electrical appliances. Growing energy demand has led to increased use of fossil fuel resources and pollution from the consumption of those resources. More study on efficiently utilizing the existing natural resources, such as biomass, solar, and mechanical energy, has been conducted as a result in recent years. The conversion of mechanical energy into electrical energy is most widely used among the smart materials known by piezoelectric material. Various piezoelectric materials like lead zirconate titanate (PZT), barium titanate (BT), potassium sodium niobate (KNN) and many more. Among these KNN has gained a lot of attention because of good electrical properties, high curie temperature and environmental friendliness.

In the present work, piezoelectric energy harvesting device was created using polyvinylidene fluoride (PVDF) and Lithium modified lead-free KNN (KNNLi) as a piezoelectric ceramic particle. KNNLi ceramic particles, were made by using conventional solid-state reaction method. The phase analysis of the prepared ceramic powder and composite films which were prepared by drop cast method was done by X-ray Diffraction (XRD) and microstructural morphology was observed by Scanning electron microscopy (SEM). The structural analysis of prepared flexible composite film was also done by Fourier Transform Infrared spectroscopy (FTIR). Further, the piezoelectric performance of the fabricated device was measured by using finger tapping technique. The results obtained in the present work suggests potential applications of KNNLi ceramic-based energy harvester technology in low voltage electronic gadgets.

*Keywords:* Piezoelectricity, Eco – Friendly, Energy harvesting

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