

Piezoelectric Ceramic Fibers with Low Sintering Temperature and Properties of Their Composites

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Important electrical and technological applications have been developed for lead-based perovskite materials in recent years. Piezoelectric ceramic fibers in the piezocomposite form are very useful for various sensor and actuator applications. The factor effecting these applications is often related to the excellent piezoelectric properties of the materials. Necessary precautions should be taken to lower the sintering temperature in order to widen the range of applications of these of these ceramics. In this study, $x[\text{Pb}(\text{Zn}_{1/3}\text{Nb}_{2/3})\text{O}_3]-(1-x)\text{Pb}(\text{Zr}_{0.48}\text{Ti}_{0.52})\text{O}_3$ (PZN-PZT) composition was investigated to fabricate fibers with low temperature sintering. There are several manufacturing processes that can be employed for the fabrication of piezoelectric fibers such as sol-gel drawing and extrusion. In this study, the fibers are drawn using an alginate gelation method. Structural characteristics of the fibers and electrical properties of the devices prepared from these fibers have been investigated and reported.

Key Words: Piezoelectric fiber, PZN-PZT, 1-3 composite, low temperature sintering