Increasing the piezoelectric responses of Polyvinylidene fluoride additively manufactured components

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Abstract

Polyvinylidene fluoride(PVDF) and its copolymer, are easily the most dominant piezoelectric polymers. Beyond that, this non-toxic thermoplastic polymer is a biocompatible material with good abrasion, radiation and chemical resistance. These favorable properties make PVDF an intriguing candidate for use in different commercial applications. PVDF's microstructure determines its electro-mechanical coupling behavior, in which the β-phase content has a significant effect on piezoelectric and pyroelectric of fabricated PVDF. The overriding goal of this study is, investigating the ways that enhance the amount of crystalline β-phase polymorph of additively manufacred PVDF structures. Successful completion of this research would enable products and prototypes that exhibit multi-functional behavior to be rapidly manufactured, a capability that will provide benefits in a variety of applications.

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