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Abstract

In-situ fabricated perovskite nanocrystals in polymeric matrix provide new generation composite materials for plenty of cutting edge technology. In this work, we report the in-situ fabrication of copper halide perovskite (MA_2CuCl_4 , $\text{MA}:\text{CH}_3\text{NH}_3^+$) embedded poly(vinylidene fluoride) (PVDF) composite films. The optimized $\text{MA}_2\text{CuCl}_4/\text{PVDF}$ composite films exhibit greatly enhanced piezo-response in comparison with pure PVDF films. The enhancements were investigated and explained by applying Piezo-response force microscopy (PFM) measurements and density functional theory (DFT) calculations. We proposed that the high piezoelectric properties of $\text{MA}_2\text{CuCl}_4/\text{PVDF}$ composite films could be related to the large Cu off-centering displacement, the strong interactions between MA_2CuCl_4

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