

Flexible Ferroelectric Polymers for Information & Energy Storage

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Abstract

Ferroelectric materials play a critical role in modern electronic industry, such as passive components, actuators, sensors et.al. Flexible ferroelectric materials are therefore highly desirable in the emerging flexible electronic technologies. Polyvinyl difluoride (PVDF) family is now still the only viable ferroelectric polymer of choice. Through the switching of their spontaneous ferroelectric polarizations, both binary data and electrical energy could be stored and recovered. This talk will cover recent progresses in ferroelectric polymers towards flexible information and energy storage. Self assembly of PVDF nanolamellae gives rise to an array of ferroelectric bit, which exhibits an high data storage density of ~ 60 GB/inch². Rational design of a interpenetrating gradient structure in the PVDF-based composites leads to much enhanced breakdown strength, suppressed remnant polarization and hence an ultrahigh discharge energy density of ~ 35 J/cm³ and efficiency of $\sim 87\%$.

References

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