



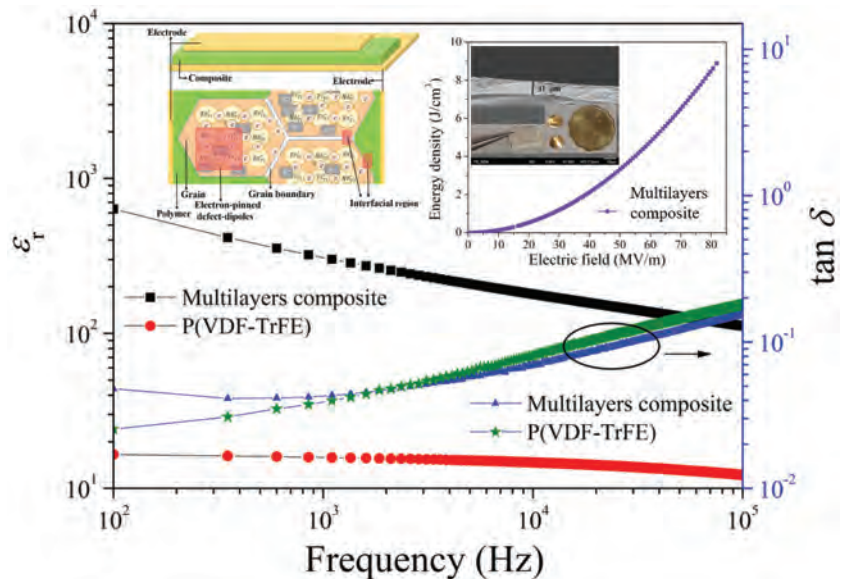
# Composite Multilayers Capacitors with Colossal Permittivity Materials for Electronics and Energy Storage Applications

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Materials with colossal permittivity (CP) have shown great technological potential for advanced microelectronics and high-energy-density storage applications. Original CP ceramics exhibit high-performance dielectric behaviors, including temperature and frequency stable CP value and sufficiently low dielectric loss. Importantly, the technology on ceramics is further developed to multilayer-structured ceramic/polymer composites. Surface hydroxylated ceramic fillers, embedded in copolymer matrix can achieve high dielectric constant and exceptional low dielectric loss over a broad frequency range, as well as high energy density. The host oxides used in this CP system is friendly to the environment, non-toxic and abundant. Additionally, the process developed is relatively simple, low cost and suitable for mass production-scale. Therefore, these composite capacitors have great technological potential for many applications. Compared to the conventional ceramic materials, these composites in this work are lightweight, scalable and easily fabricated into complex shapes towards miniaturization of the compact systems. The additional flexibility feature of them also possess broad application prospects in modern electronic and energy storage devices.

## Special Features

- Flexible composite capacitor with CP materials
- Friendly to the environment, non-toxic and abundant
- Simple and low cost processing



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