Energy Materials

Supplementary Materials

High energy density and efficiency in all-organic P(VDF-TrFE-CFE)/PMMA dielectric films enabled by dipolar interaction and γ-irradiation

Yabo Wu[1,#], Zhiqiang Zhang[1,#], Yihao Zhang[3,#], Zhaoxin Ma[1,#], Changji Deng[1], Song Zhang[1], Bowen Bai[2], Weicong Liu[2], Yifan Huang[2,*], Qingfeng Zhang[1,*], Yongming Hu[1,*]

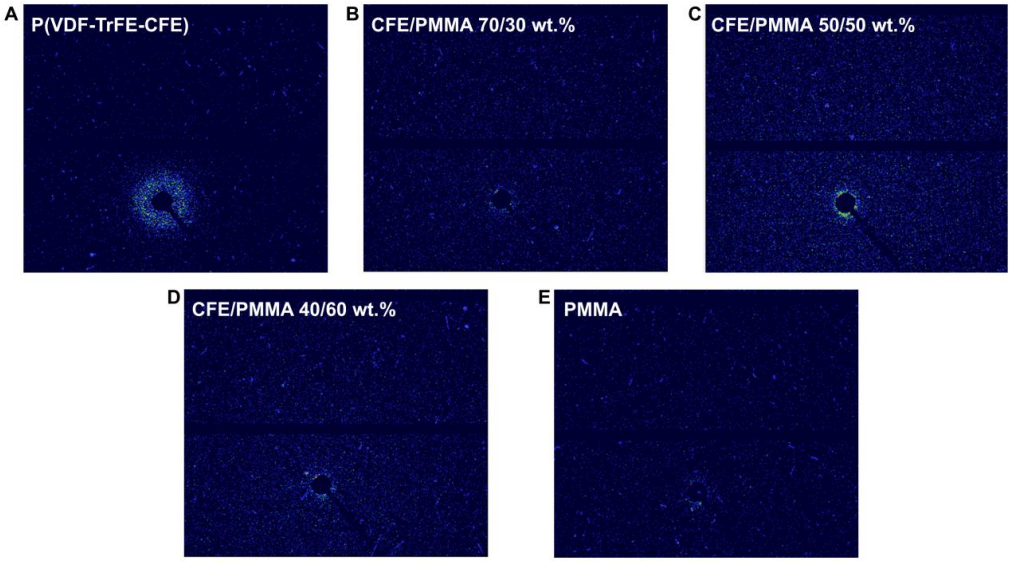
[1]Hubei Key Laboratory of Micro-Nanoelectronic Materials and Devices, Hubei University, Wuhan 430062, Hubei, China.

[2]Research Institute of Physical Sciences in Special Environments, Harbin Institute of Technology (Shenzhen), Shenzhen 518055, Guangdong, China.

[3]College of Energy Materials and Chemistry, Inner Mongolia University, Hohhot, 010021, Inner Mongolia, China.

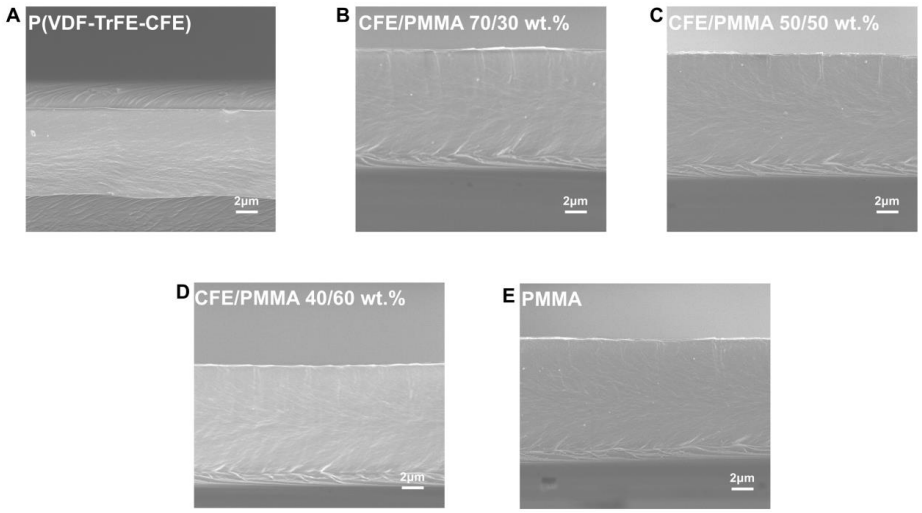
[#]Authors contributed equally.

[*]**Correspondence to:** Prof. Yifan Huang, Research Institute of Physical Sciences in Special Environments, Harbin Institute of Technology (Shenzhen), Shenzhen 518055, Guangdong, China. E-mail: yifanhuang@hit.edu.cn; Prof. Qingfeng Zhang, Prof. Yongming Hu, Hubei Key Laboratory of Micro-Nanoelectronic Materials and Devices, Hubei University, Wuhan 430062, Hubei, China. E-mail: zhangqingfeng@hubu.edu.cn; huym@hubu.edu.cn

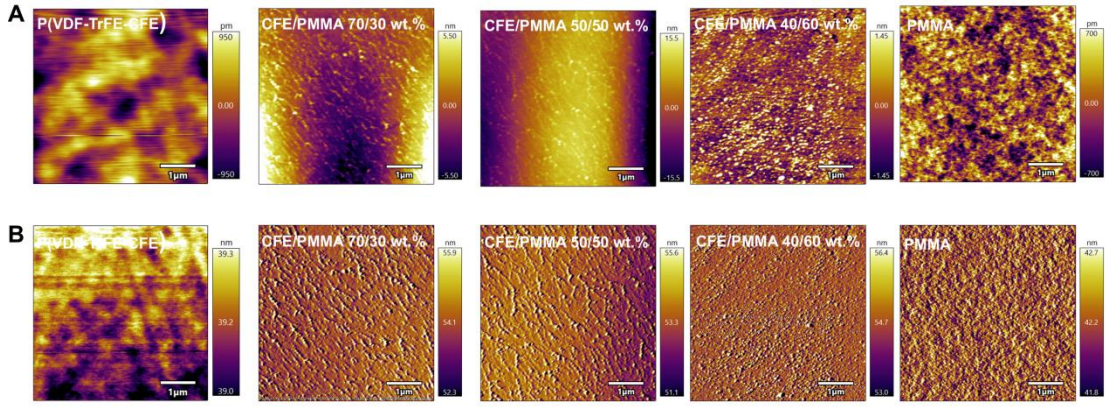


Supplementary Figure S1. 2D SAXS patterns of P(VDF-TrFE-CFE)/PMMA films with different compositions.

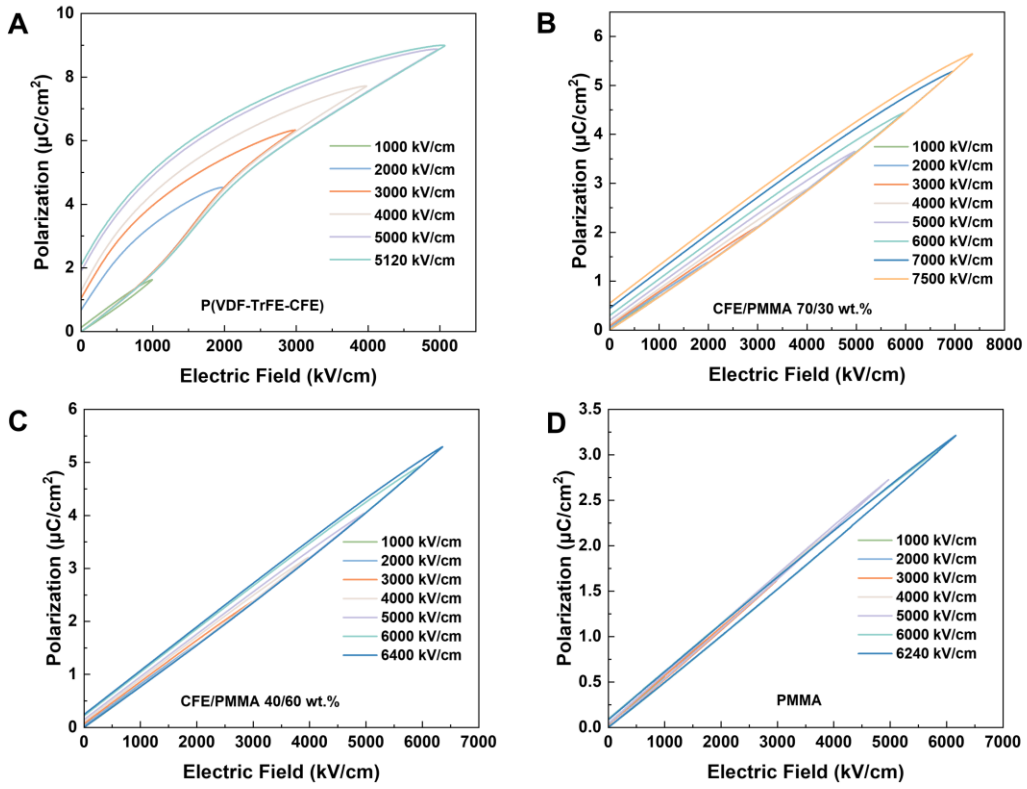
Supplementary Figure S2. 2D WAXS patterns of P(VDF-TrFE-CFE)/PMMA films with different compositions.



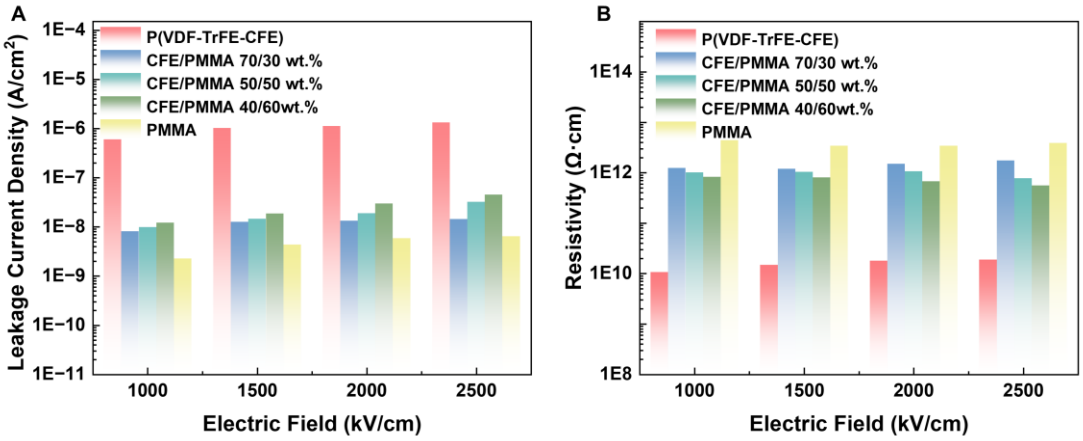
Supplementary Figure S3. Cross-sectional SEM images of films with different compositions P(VDF-TrFE-CFE)/PMMA.



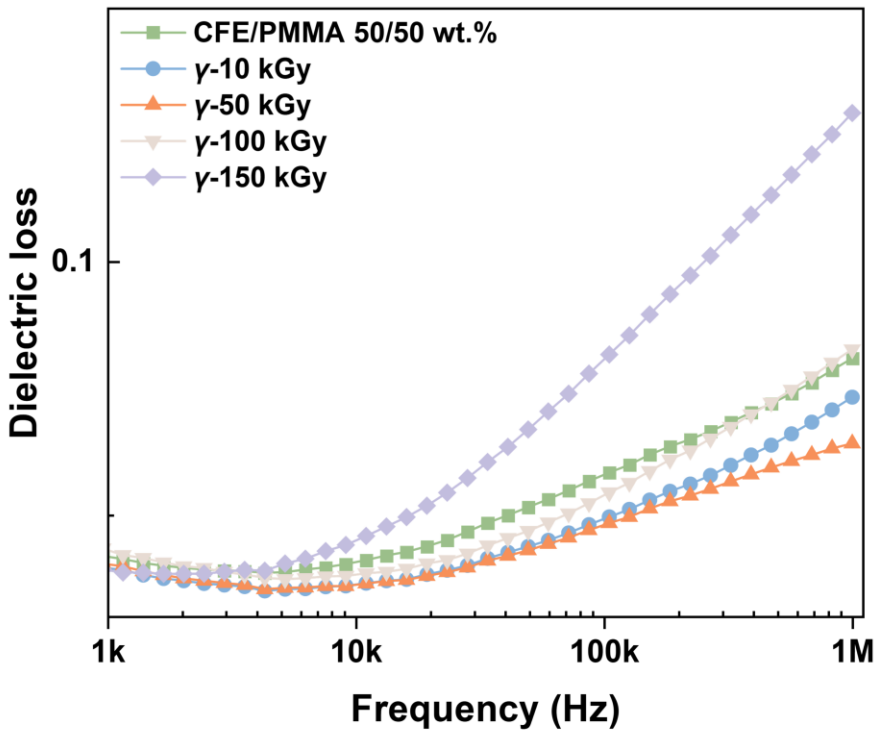
Supplementary Figure S4. AFM characterization of P(VDF-TrFE-CFE)/PMMA films with different compositions: (A) surface topography images; (B) corresponding amplitude images.



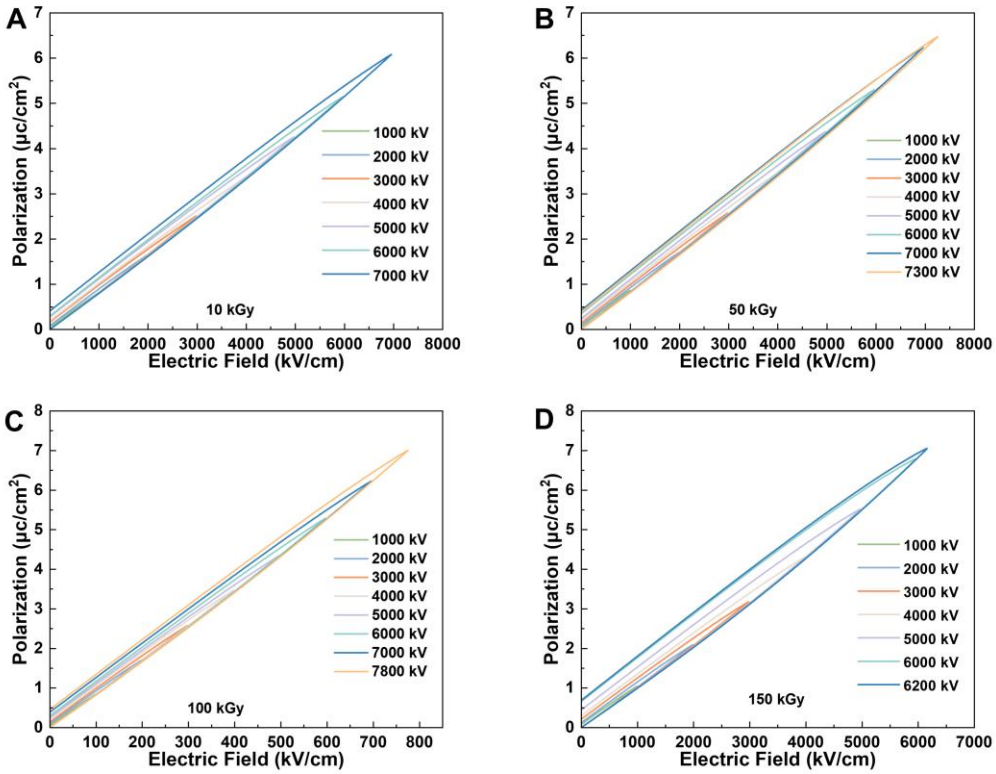
Supplementary Figure S5. *P–E* loops of P(VDF-TrFE-CFE)/PMMA films with different compositions.



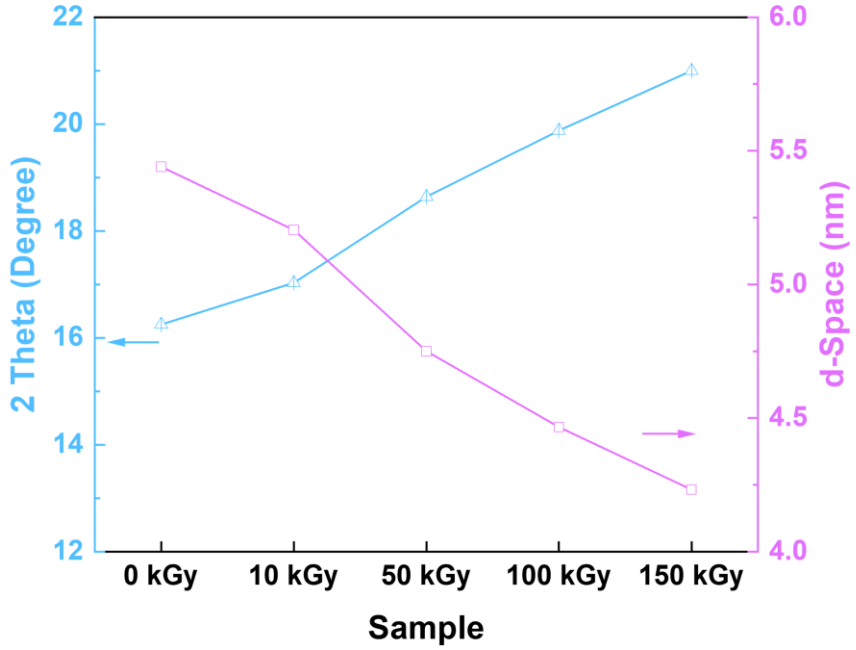
Supplementary Figure S6. Leakage current density-electric field (*J*-*E*) characteristics and volume resistivity as a function of electric field for P(VDF-TrFE-CFE)/PMMA films with different compositions.



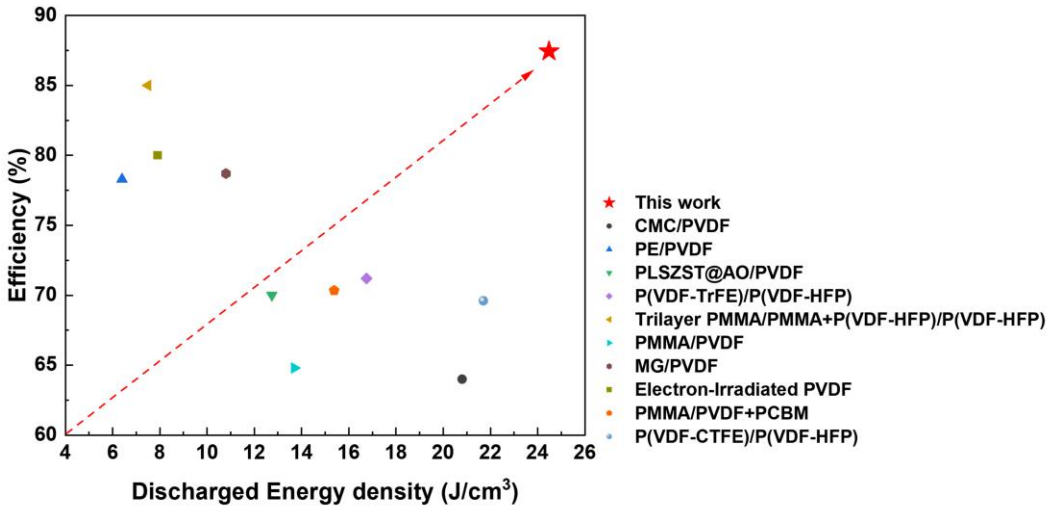
Supplementary Figure S7. Frequency-dependent dielectric loss of the γ-irradiated P(VDF-TrFE-CFE)/PMMA 50/50 wt.% films.



Supplementary Figure S8. *P–E* loops of *γ*-irradiated P(VDF-TrFE-CFE)/PMMA 50/50 wt.% films.



Supplementary Figure S9. Trends in XRD peak position and chain spacing.



Supplementary Figure S10. Comparison with the performance of representative all-organic materials in recent years.