

Electroactive phase dependent triboelectric nanogenerator performance of PVDF-TiO₂ composites

Irthasa Aazem,^{ab} Charchit Kumar,^d Ryan Walden,^{ab} Aswathy Babu,^{ab} Amit Goswami,^{ac} Steven Hinder,^e Gaurav Khandelwal,^d Daniel M. Mulvihill,^d Gerard McGrenaghan,^{ac} *Suresh C. Pillai *^{ab}

^a *Nanotechnology and Bio-Engineering Research Group, Department of Environmental Science, Atlantic Technological University, ATU Sligo, Ash Lane, Sligo, F91 YW50, Ireland*

E-mail: Suresh.Pillai@atu.ie

^b *Health and Biomedical (HEAL) Strategic Research Centre, Atlantic Technological University, ATU Sligo, Ash Lane, Sligo, F91 YW50, Ireland*

^c *Department of Mechanical and Manufacturing Engineering, Atlantic Technological University, Ash Lane, Sligo F91 YW50, Ireland*

^d *Materials and Manufacturing Research Group, James Watt School of Engineering, University of Glasgow, Glasgow G12 8QQ, UK*

^e *The Surface Analysis Laboratory, Faculty of Engineering and Physical Sciences, University of Surrey, Guildford, Surrey GU2 7XH, UK*

*Corresponding Author

Email addresses: Irthasa.AazemVS@research.atu.ie (Irthasa Aazem VS),

Suresh.Pillai@atu.ie (Suresh C. Pillai)

Table of contents for the supporting data:

Figure S1. Photographic image and cross-sectional SEM image of a PVT900 film.

Figure S2. Comparison of XRD patterns of TiO₂400 – TiO₂1000.

Figure S3. SEM images of drop casted and spin-coated PVDF films.

Figure S4. SEM images of spin-coated PVDF film and PVDF – TiO₂ films with 15 wt% TiO₂ loading – (a) Pristine PVDF film, (b) PVDF – TiO₂500 film, (c) PVDF – TiO₂600 film, (d) PVDF – TiO₂700 film, (e) PVDF – TiO₂900 film and (f) PVDF – TiO₂1000 film.

Figure S5: PE effect contribution on the electrical output of PVDF tested by pairing with ITO-coated PET films at a contact force 60N and a frequency of.

Video S6. Video demonstration of the TENG ability of the fabricated device by glowing 46 LEDs connected in series to the PVDF – TiO₂900 film TENG.

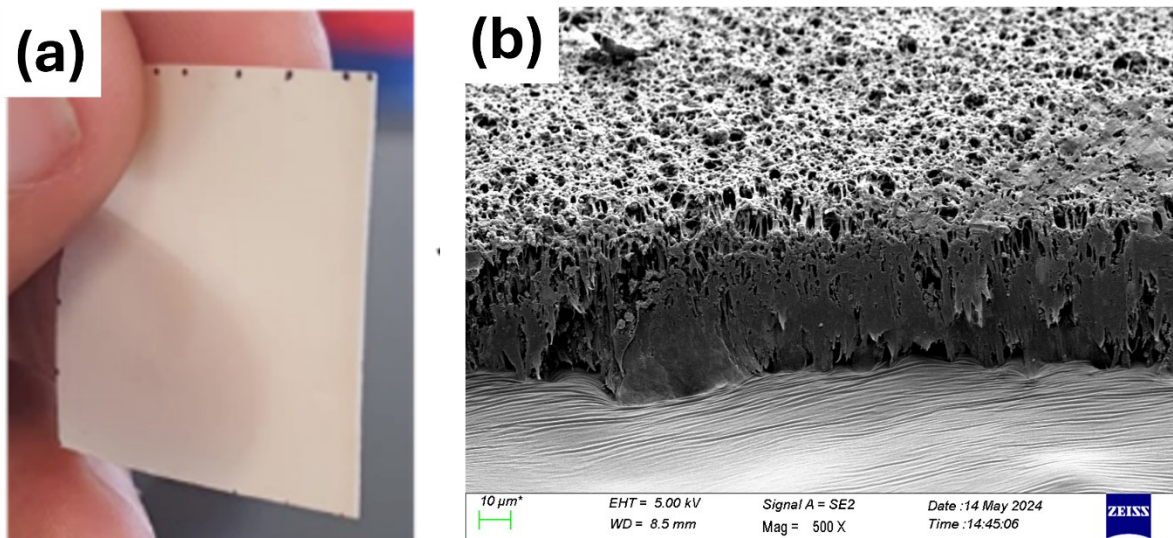


Figure S1. Photographic image (a) and cross-sectional SEM image (b) of a PVT900 film

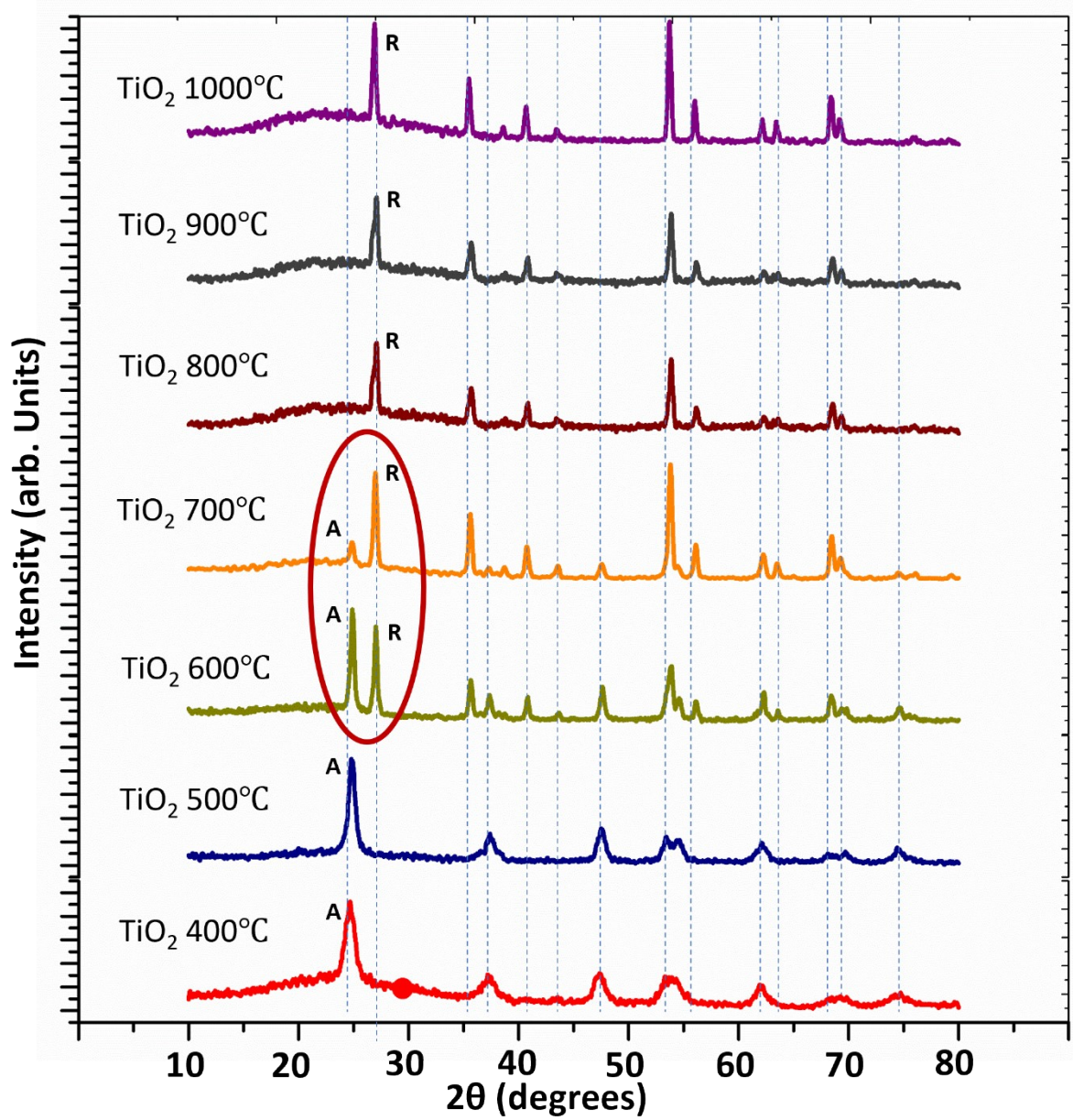


Figure S2. Comparison of XRD patterns of TiO₂400 – TiO₂1000

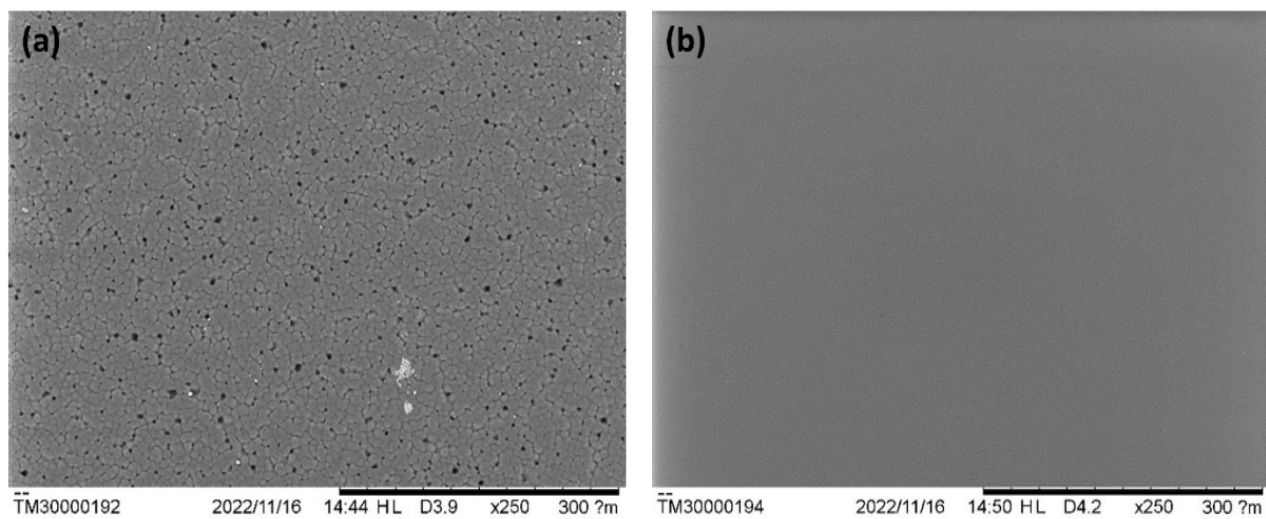


Figure S3. SEM images of (a) drop casted and (b) spin-coated PVDF films

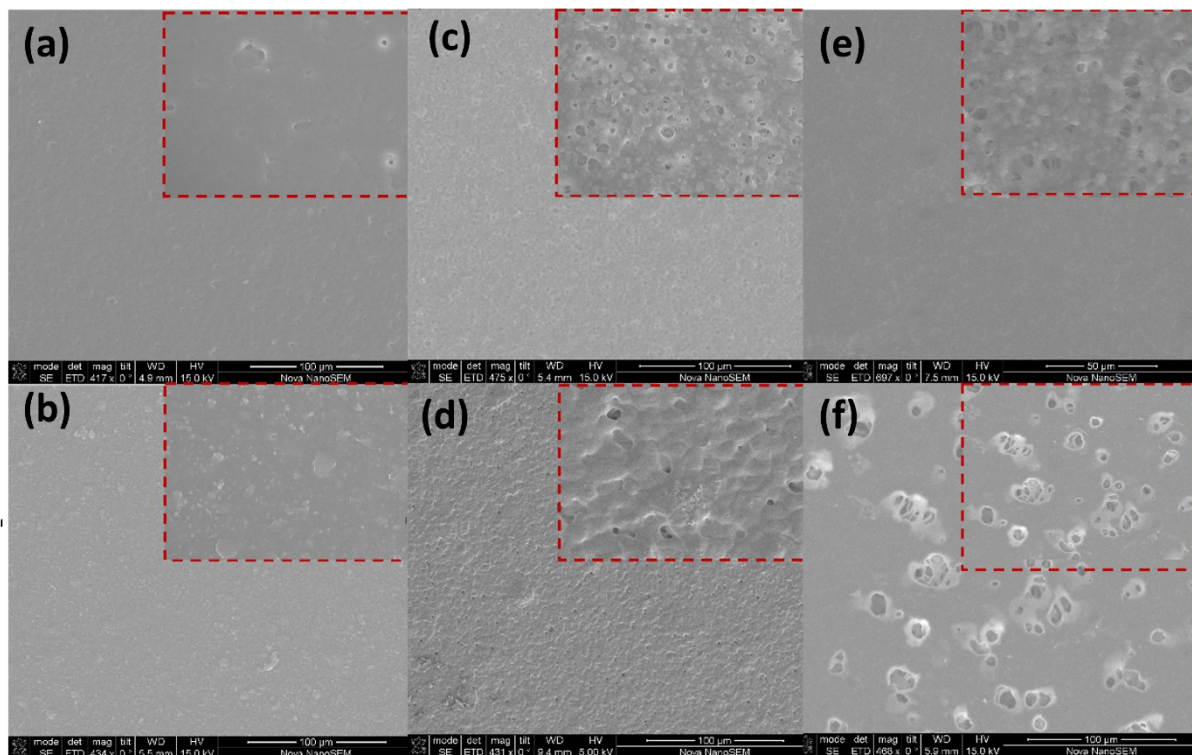


Figure S4. SEM images of spin-coated PVDF film and PVDF – TiO₂ films with 15 wt% TiO₂ loading – (a) Pristine PVDF film, (b) PVDF – TiO₂500 film, (c) PVDF – TiO₂600 film, (d) PVDF – TiO₂700 film, (e) PVDF – TiO₂900 film and (f) PVDF – TiO₂1000 film

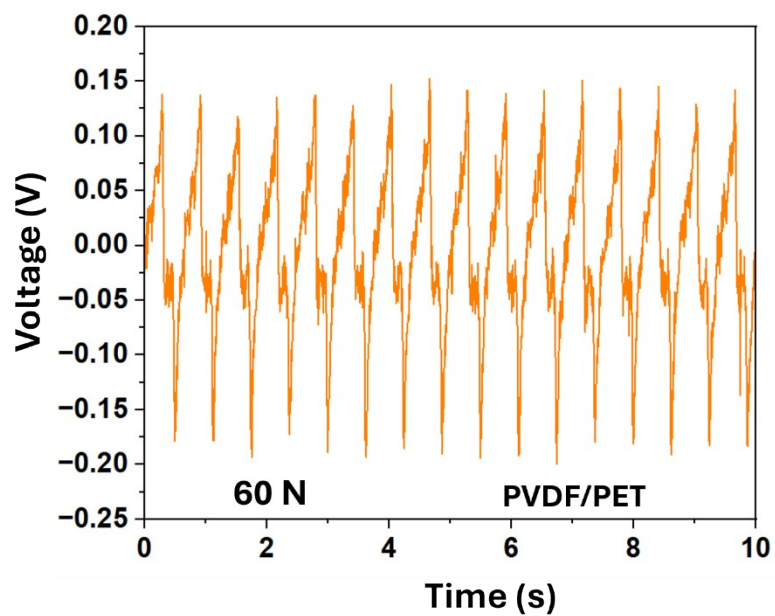


Figure S5: PE effect contribution on the electrical output of PVDF tested by pairing with ITO-coated PET films at a contact force 60N and a frequency of.

Video S6 attached