**Supporting Information**

# Enhanced Performances of Triboelectric Nanogenerator by Filling Hierarchical Flower-Like $TiO_2$ Particles into Polymethyl Methacrylate Film

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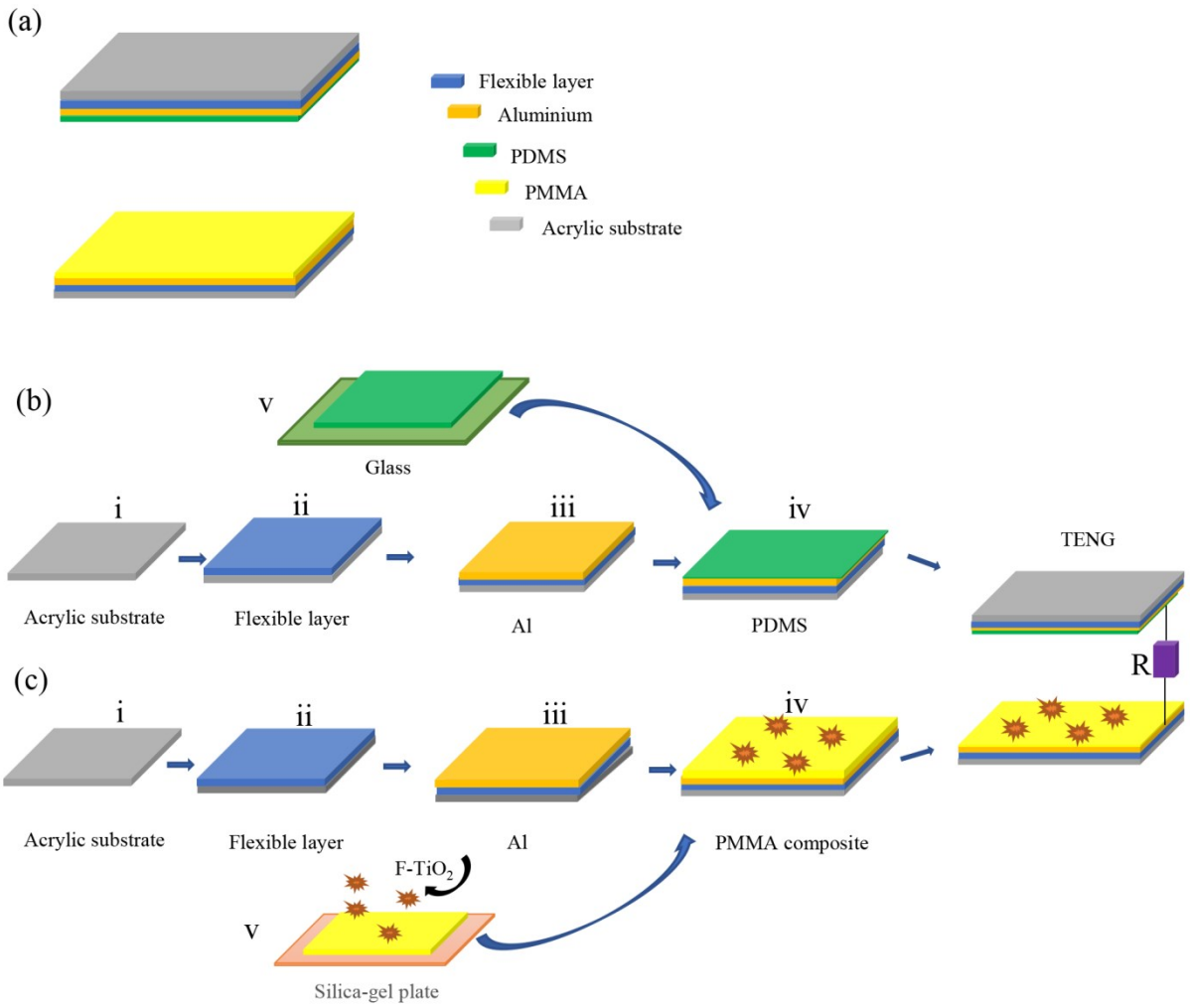


Figure S1. (a) The schematic illustration of the triboelectric nanogenerator. (b) The schematic of fabrication process of PMMA/F-$TiO_2$ composite. (c) The schematic of fabrication process of PDMS.

Morphology of $TiO_2$ particles

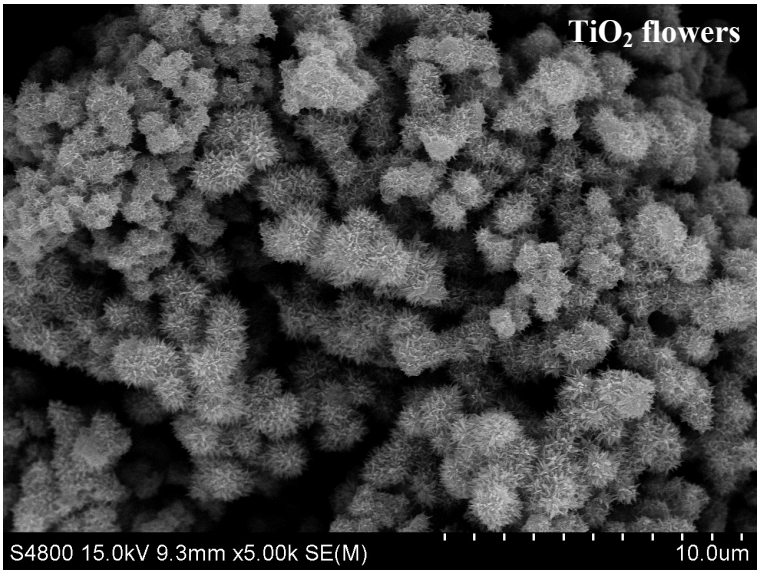


Figure S2. SEM image of flower-like $TiO_2$ particles.

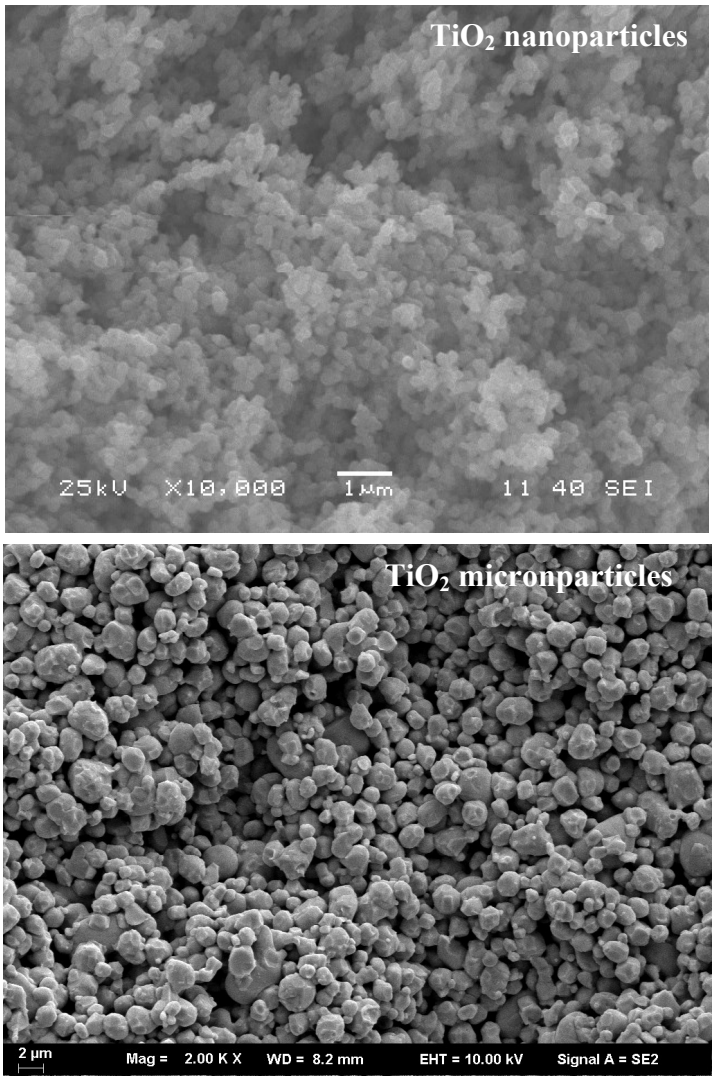


Figure S3. SEM image of $TiO_2$ nanoparticles and micronparticles.

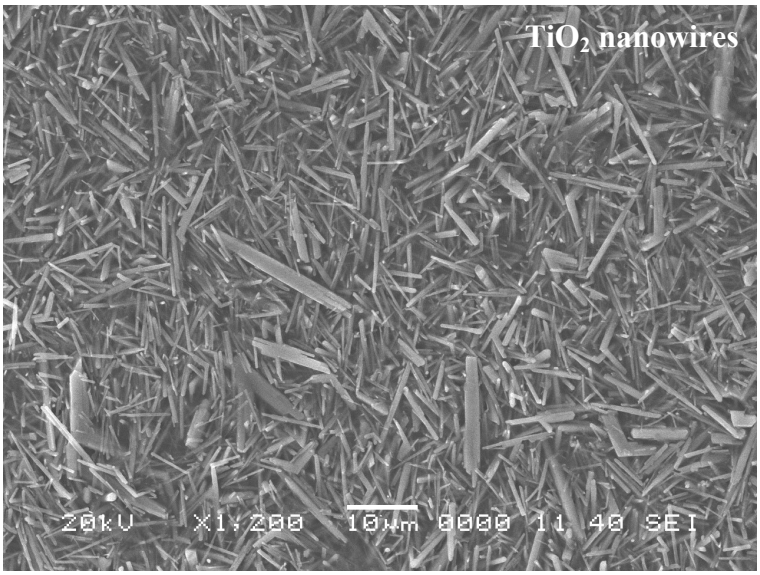


Figure S4. SEM image of $TiO_2$ nanowires.

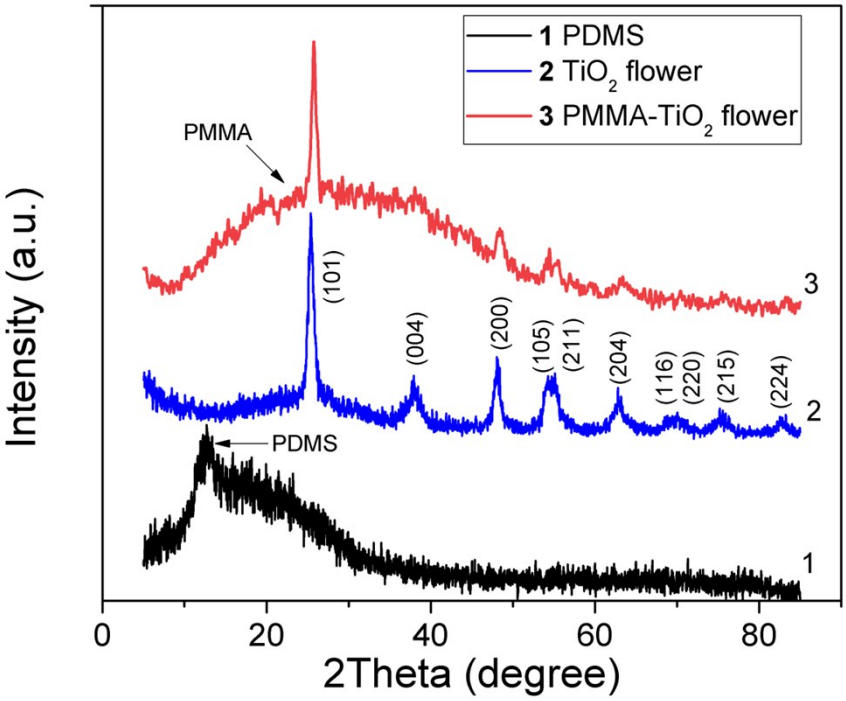


Figure S5. XRD patterns of the PDMS film, the $TiO_2$ flower and PMMA-$TiO_2$ flower composites. The phase of the positive and negative tribo-materials can be confirmed, which are PMMA-$TiO_2$ flower composites and the PMDS film, respectively.

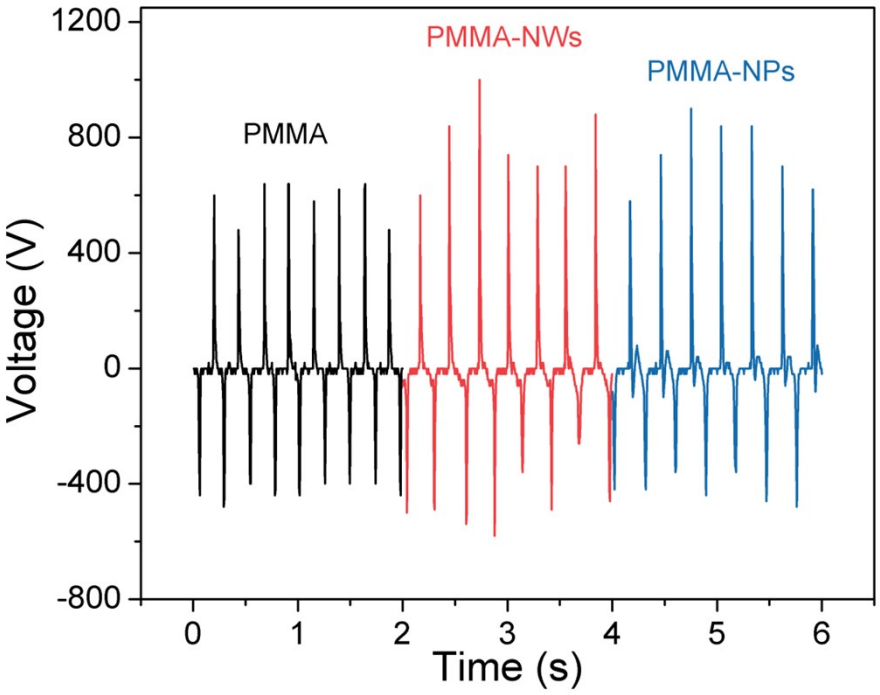


Figure S6. The open-circuit voltage of PDMS/PMMA-40%($TiO_2$ NWs), PDMS/PMMA-40% ($TiO_2$ NPs) and PDMS/PMMA TENGs.

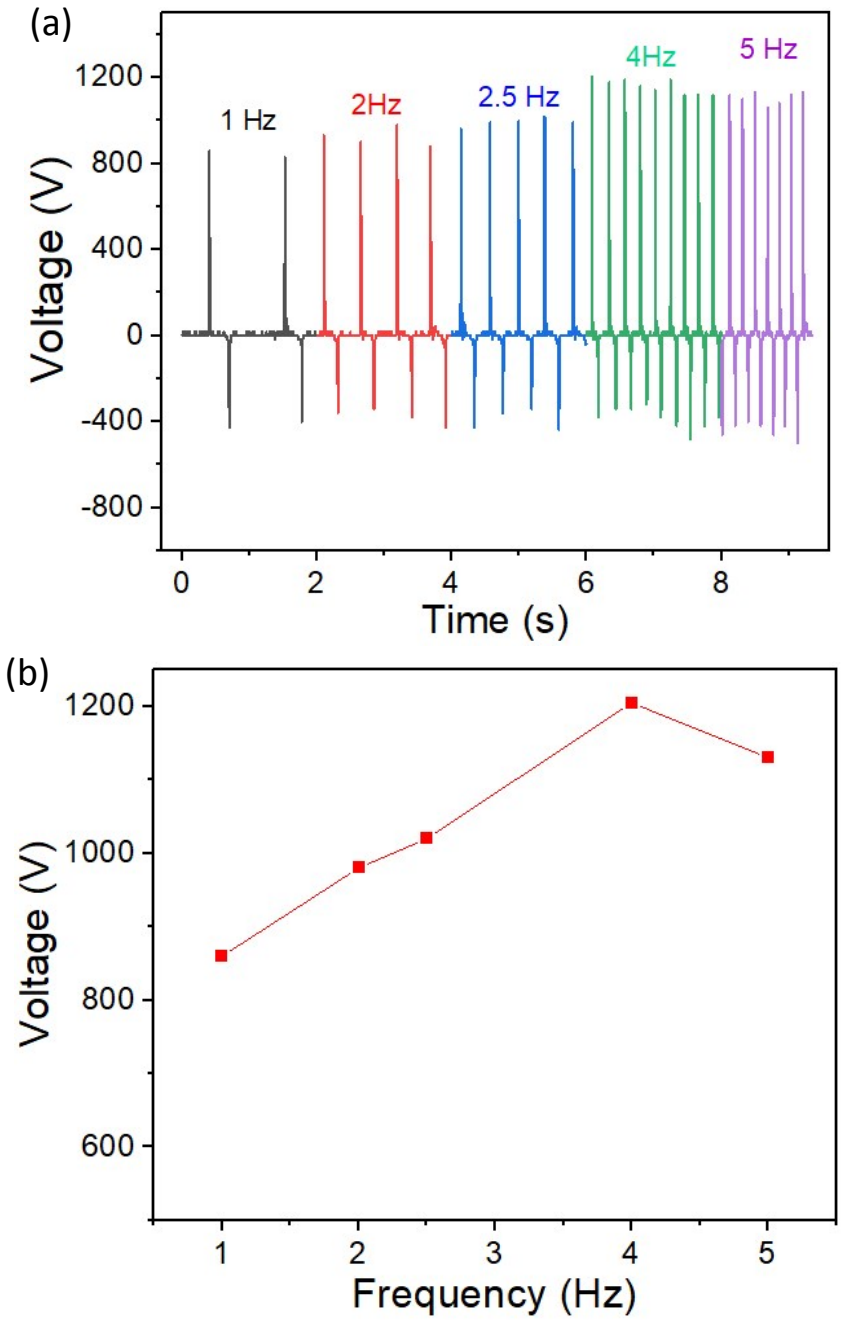


Figure S7. (a) The open-circuit voltage of the PDMS/PMMA-40%(F-$TiO_2$) TENG at different frequencies. (b) The positive peak open-circuit voltage of the PDMS/PMMA-40%(F-$TiO_2$) TENG as a function of the frequency.

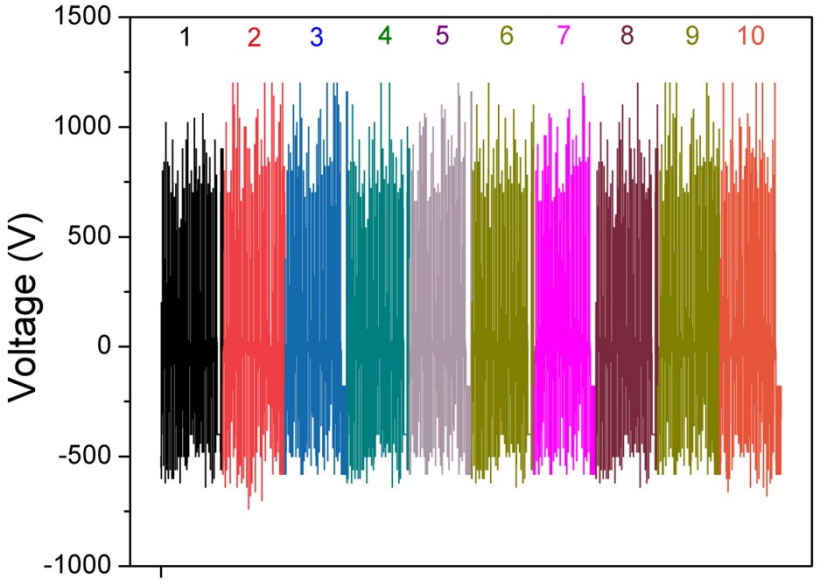


Figure S8. Open-circuit voltage outputs of the PDMS/PMMA-40%(F-$TO_2$) TENG at different days (50 cycles each day, 1–10 days) after the device was fabricated. Good stability and reliability of the TENG can be observed.