

# Supplementary Materials: Free-Standing Graphene/PVDF Film for All-Solid-State<sup>F</sup> Supercapacitors towards Self-Powered Systems

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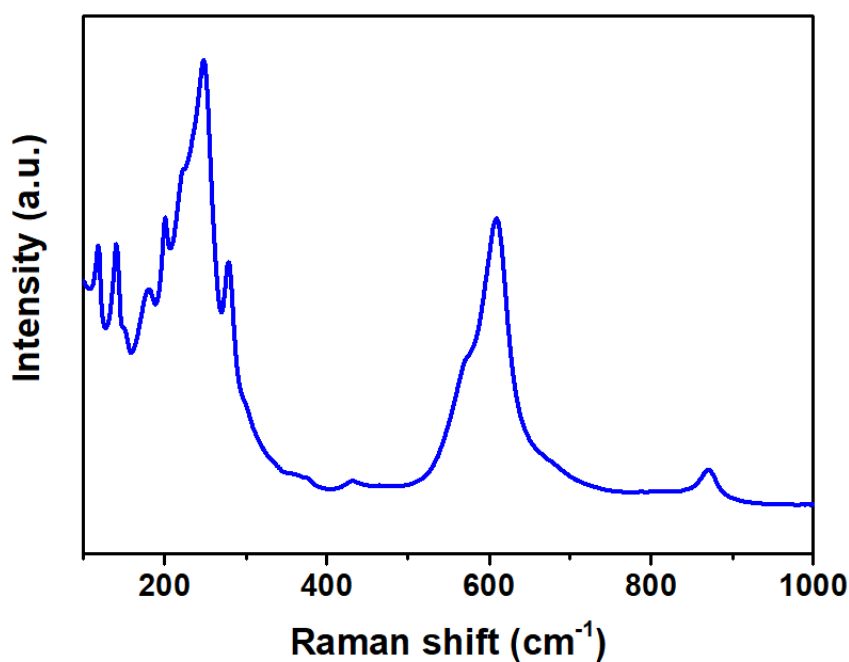


Figure S1. Raman spectrum of sodium niobate.

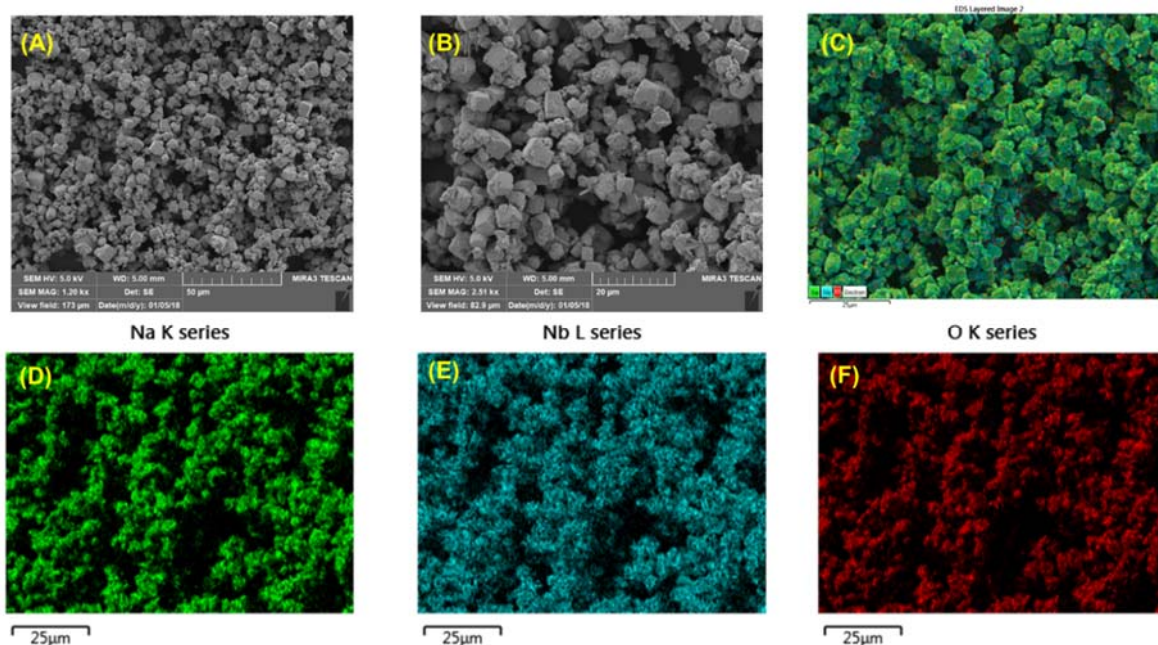
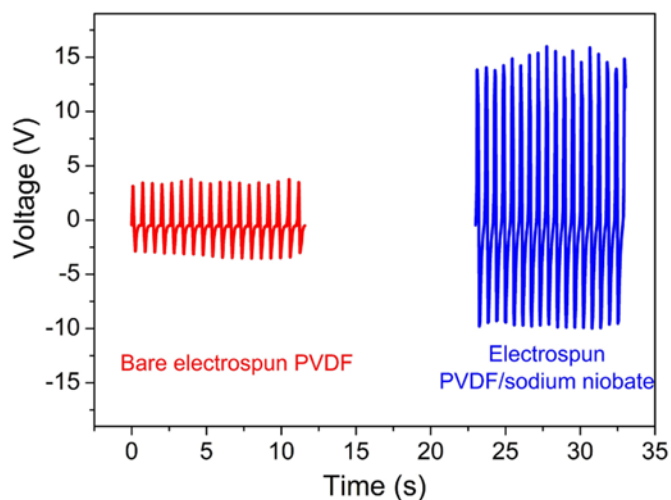
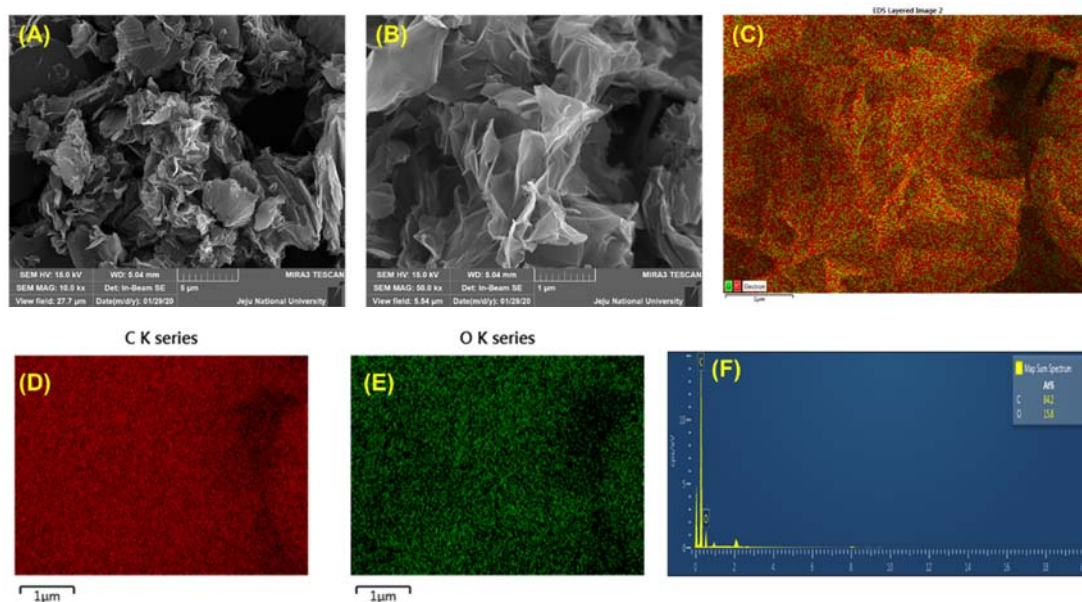


Figure S2. FESEM and elemental mapping analysis of sodium niobate.



**Figure S3.** Comparative voltage output of bare PVDF and PVDF/sodium niobate subjected to an applied compressive force of 10 N.



**Figure S4.** FESEM micrograph of reduced graphene oxide (A) high magnification; (B) low magnification; (C) overlay field emission micrograph, (D) elemental mapping analysis of carbon; (E) elemental mapping analysis of oxygen present in the reduced graphene oxide and (F) EDS spectrum of the reduced graphene oxide.

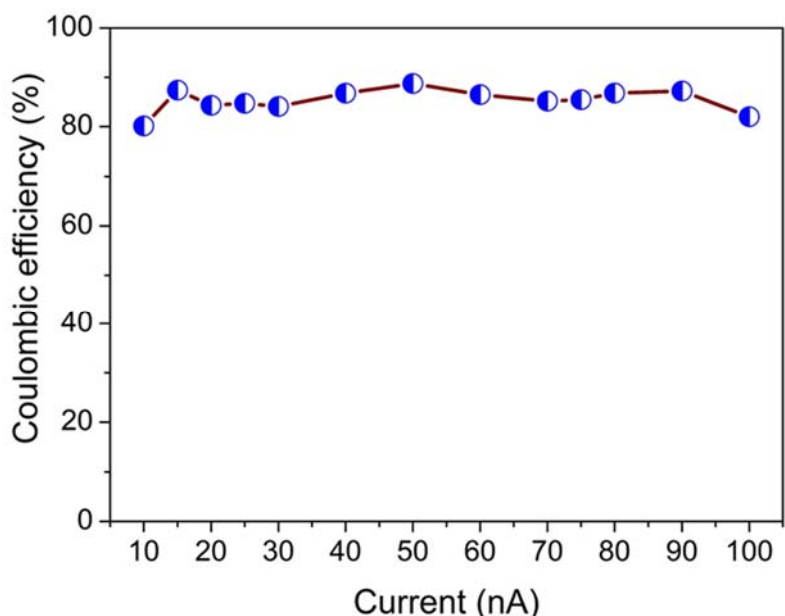


Figure S5. Coulombic efficiency of the PVDF/reduced graphene oxide SSC as a function of current.

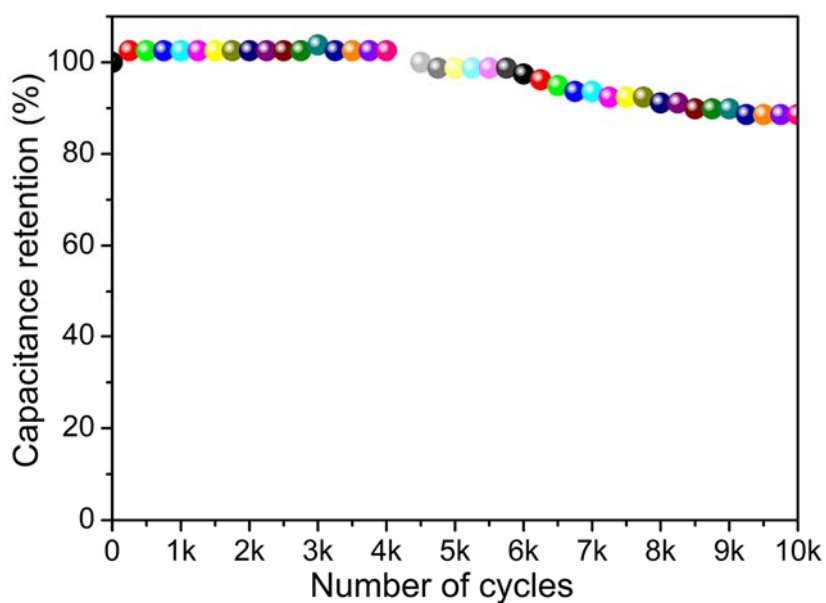
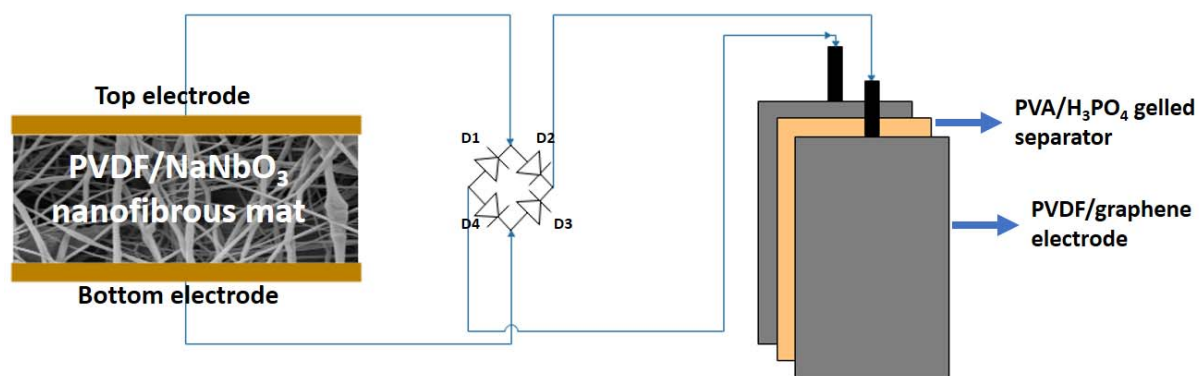
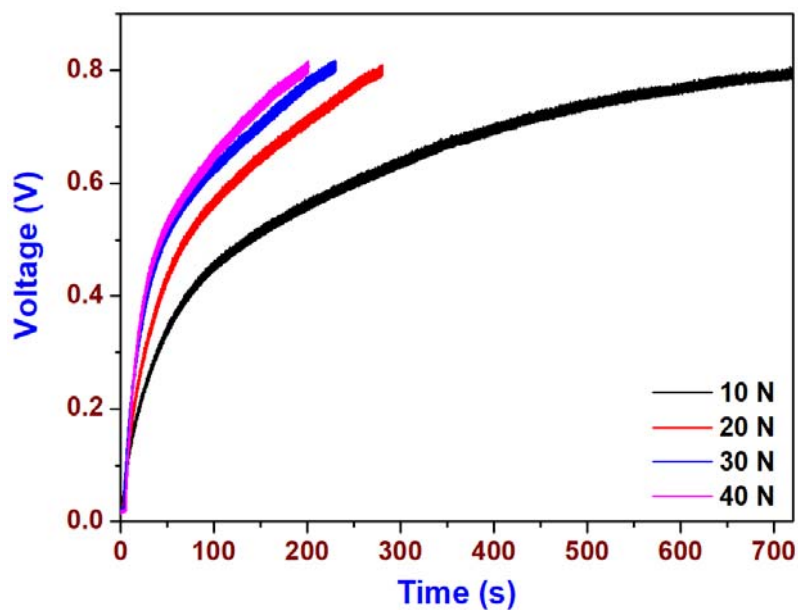


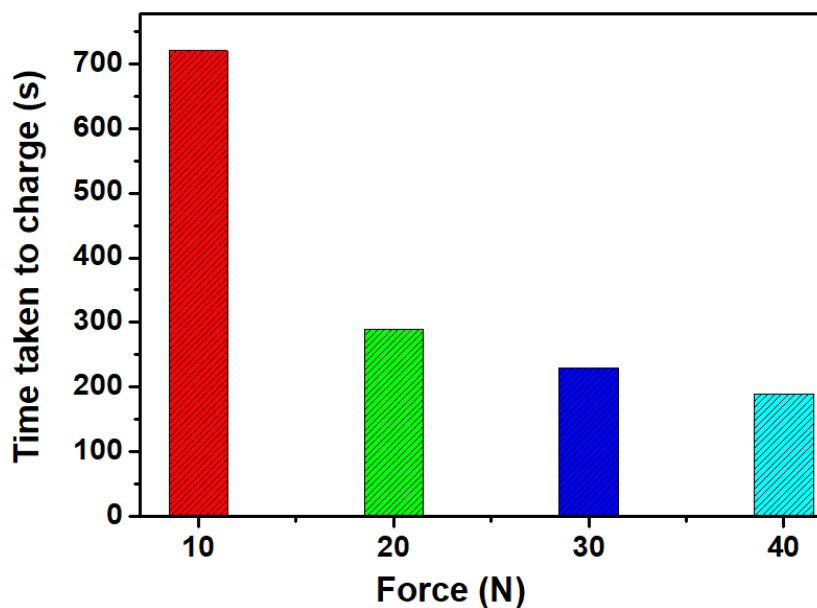
Figure S6. Cyclic stability of PVDF/reduced graphene oxide SSC device over 10,000 continuous cycles charge-discharge analysis measured at a current density of 50 nA.



**Figure S7.** Schematic representation of the self-charging system with supercapacitor and nanogenerator.



**Figure S8.** The charging profile of the PVDF/reduced graphene oxide SSC with the different applied compressive force applied to the PVDF/sodium niobate nanogenerator device.



**Figure S9.** Comparison of time to charge the PVDF/reduced graphene oxide SSC with the applied compressive force.



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