Supporting Information

Ultra-thin and Strong Electrospun Porous Fiber Separator

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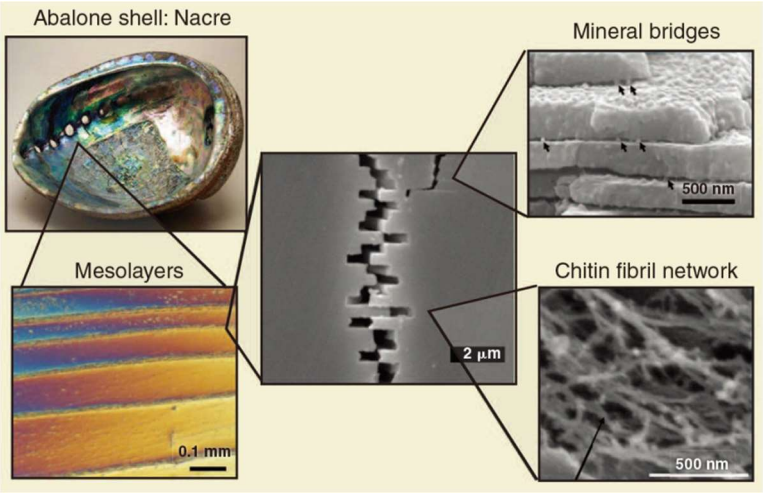

Figure S1. Hierarchical structures of tough biological materials (Abalone nacre) with growth layers (mesolayers), the fibrous chitin network (organic-inorganic layer) and multilayer heterogeneous interfaces (mineral bridges).

Figure S2. Photographs of the PVdF/DMF solution used for electrospinning containing ~10 wt.% NH_4HCO_3 and ~15 wt.% treated SiO_2 NPs. The SiO_2 NPs show good dispersion even after 3 hours without any stirring.

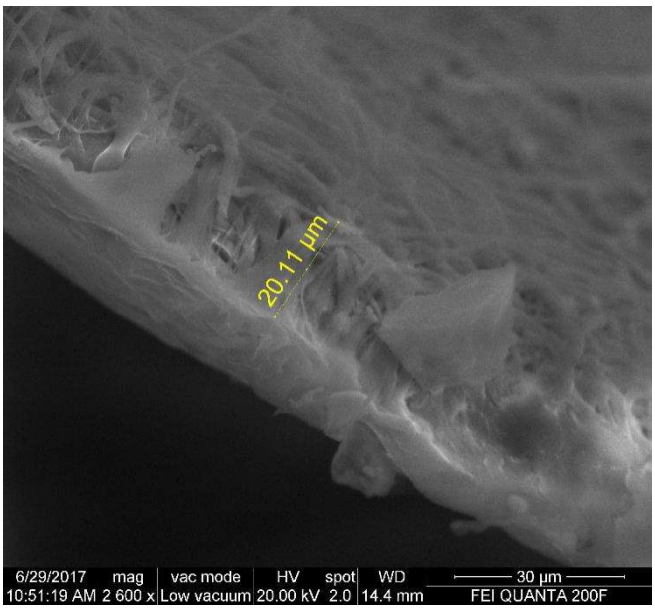

Figure S3. The cross-section SEM image of the composite separator.

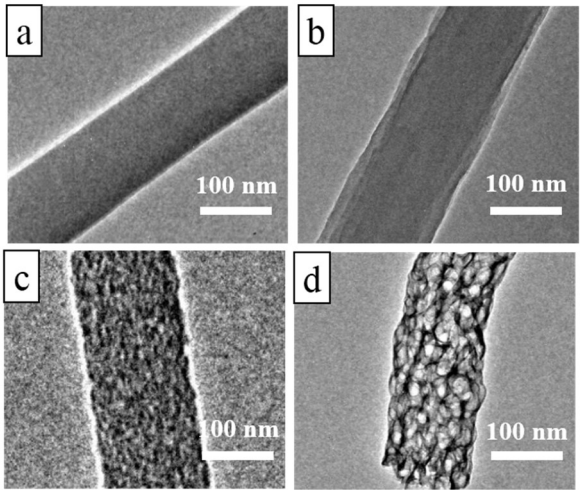

Figure S4. TEM images of PE fibers of PVdF/PE/PVdF separator with various NH_4HCO_3 contents: (a) 0 wt.%; (b) 5 wt.%; (c) 10 wt.%; (d) 15 wt.%.

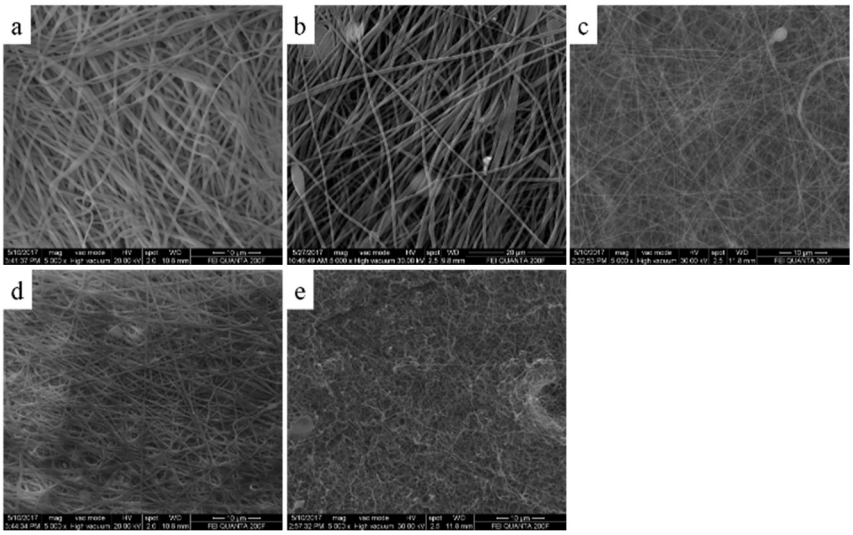

Figure S5. Low-resolution SEM images of the surface morphology for the PVdF/PE/PVdF separator with various amount of SiO_2 NPs: (a) 0 wt.%, (b) 5 wt. %, (c) 10 wt. %, (d) 15 wt. % and (e) 20 wt.%.

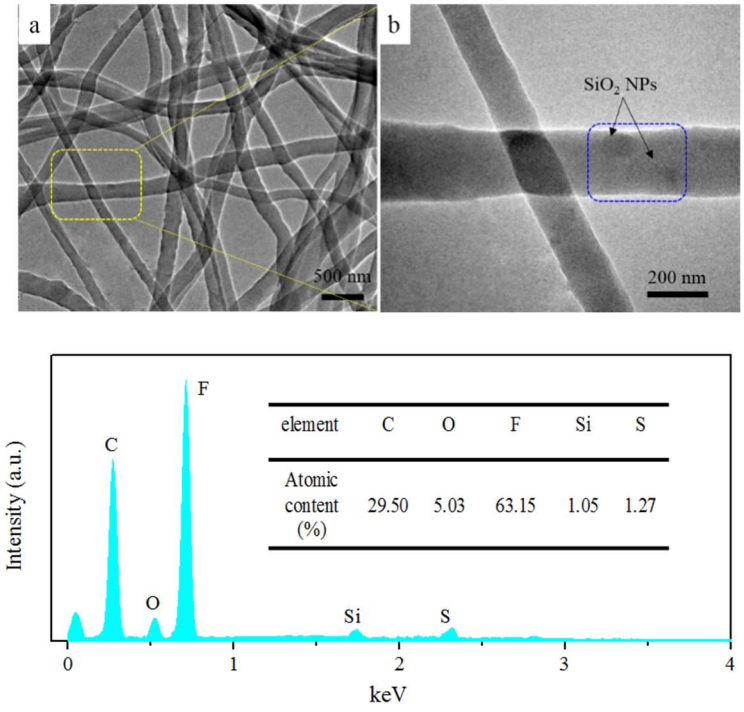

Figure S6. The low (a) and high-resolution (b) TEM images of PVdF fibers decorated with SiO_2 NPs (~15 wt.%) and the corresponding EDS results from the selected section (blue).

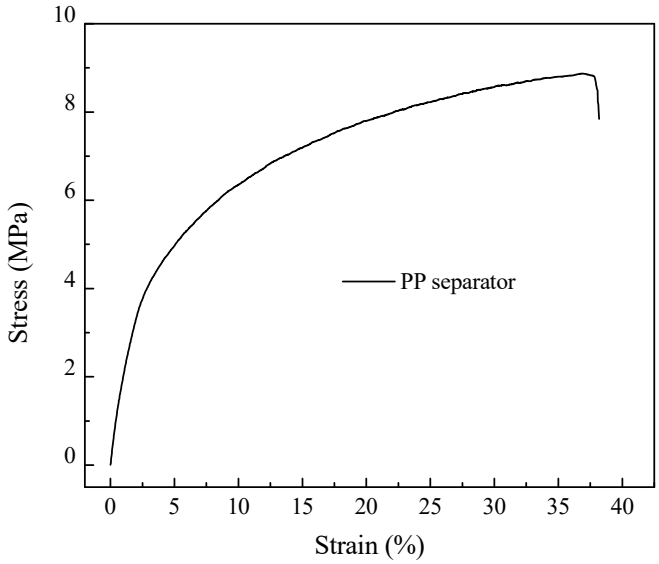

Figure S7. The stress-strain curve of the commercial PP separator.