Supporting Information for

Inhibition of Zinc Dendrites Realized by a β-P(VDF-TrFE) Nanofiber Layer in Aqueous Zn-Ion Batteries

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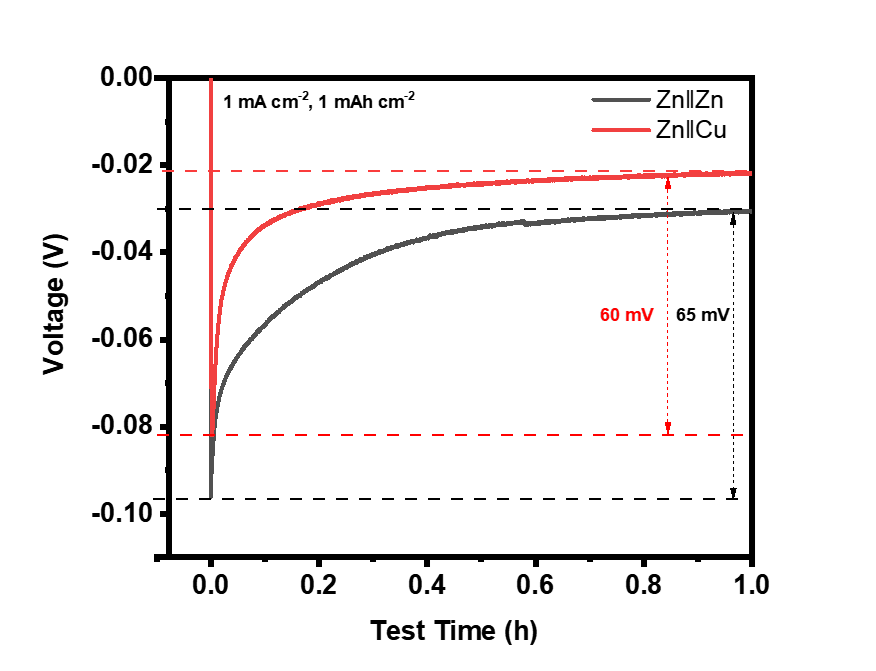
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**Figure S1**. The voltage-time curves during Zinc nucleation at 1 mA cm-2 on Zn and Cu substrate.



**Figure S2.** Ionic resistivity measurement of the bare Cu and PNF-Cu symmetric cells with the glass fiber as a separator. Nyquist plots were tested at open circuit voltage (OCV) over the frequency range of 100 kHz to 0.1 Hz.

Formula used for calculating the conductivity,

*σ*

Where,

*L*glass fiber = 0.211 mm

*S* = 0.7854 cm2

*R*b (glass fiber) = 0.4868 Ω

*σ*glass fiber = 5.5×10-2 S cm-1

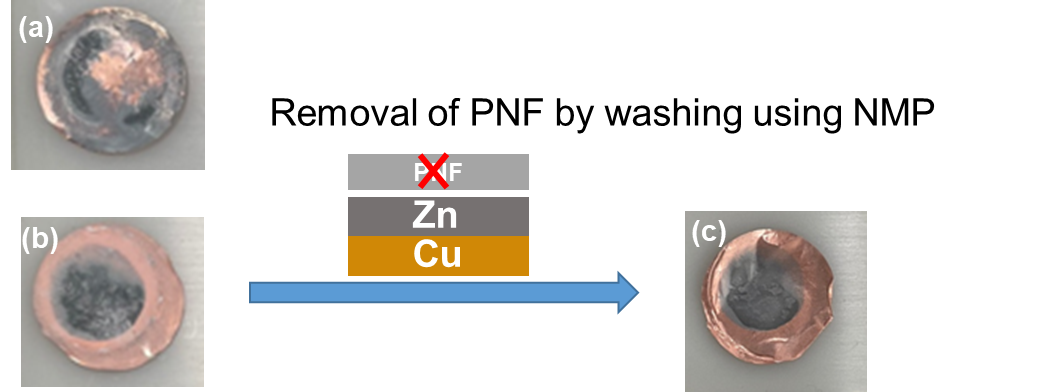
*Rb*(PVDF-TrFE) = Rb-Rb (glass fiber) = 0.04921 Ω

*L*P(VDF-TrFE) = 5 μm × 2 = 10 μm

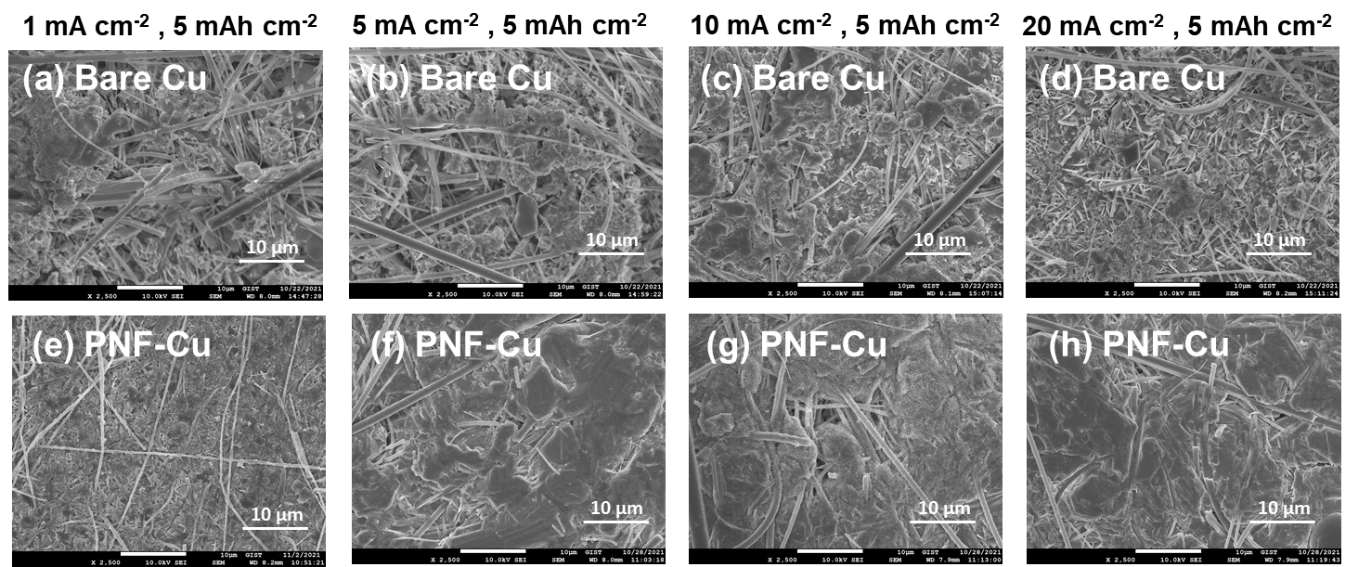
*σ*P(VDF-TrFE) = 2.59×10-2 S cm-1



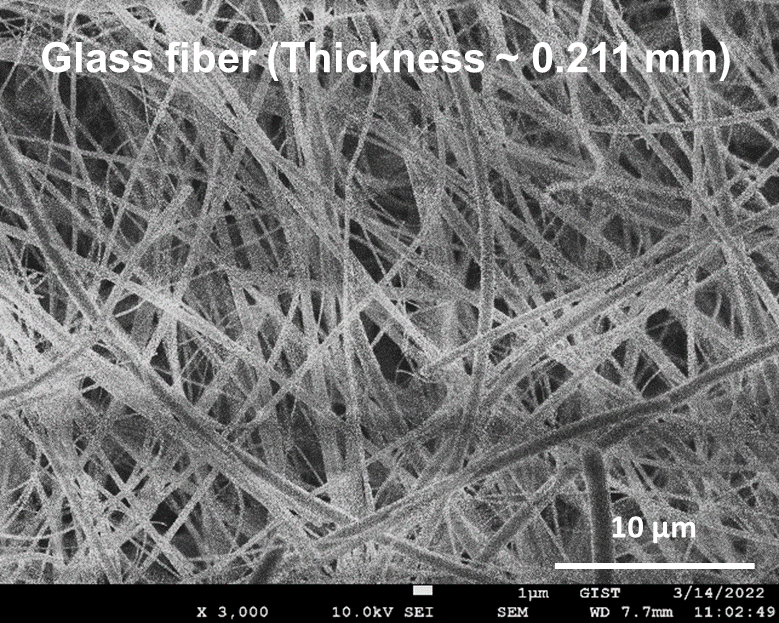
**Figure S3.** XRD data of the bare Zn and PNF-Zn after immersion in the electrolyte for 7 days.



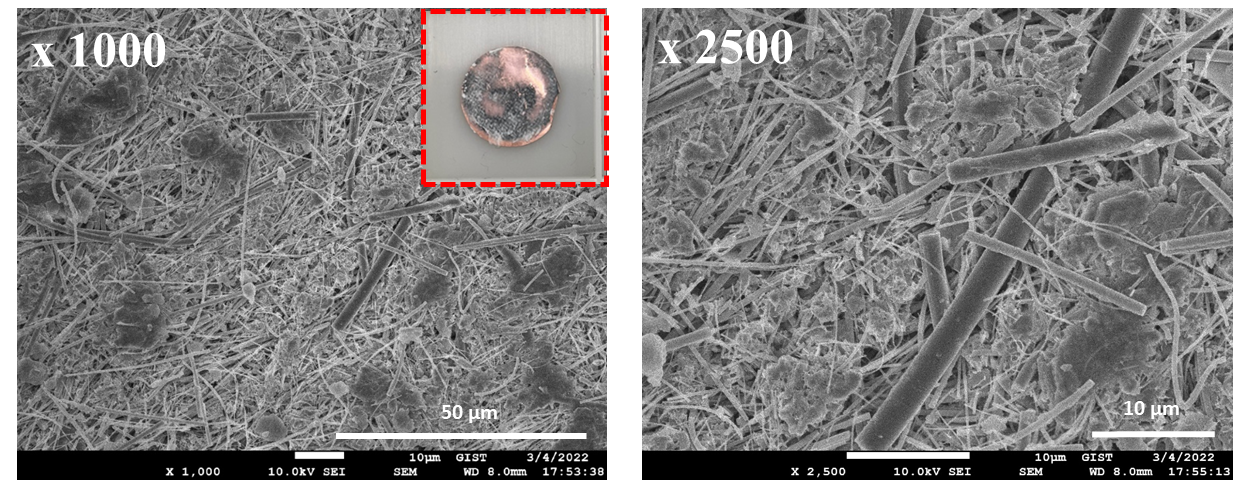
**Figure S4.** Digital images of Zn deposition on the (a) bare Cu and PNF-Cu (b) before removal and (c) after removal of the PNF layer.



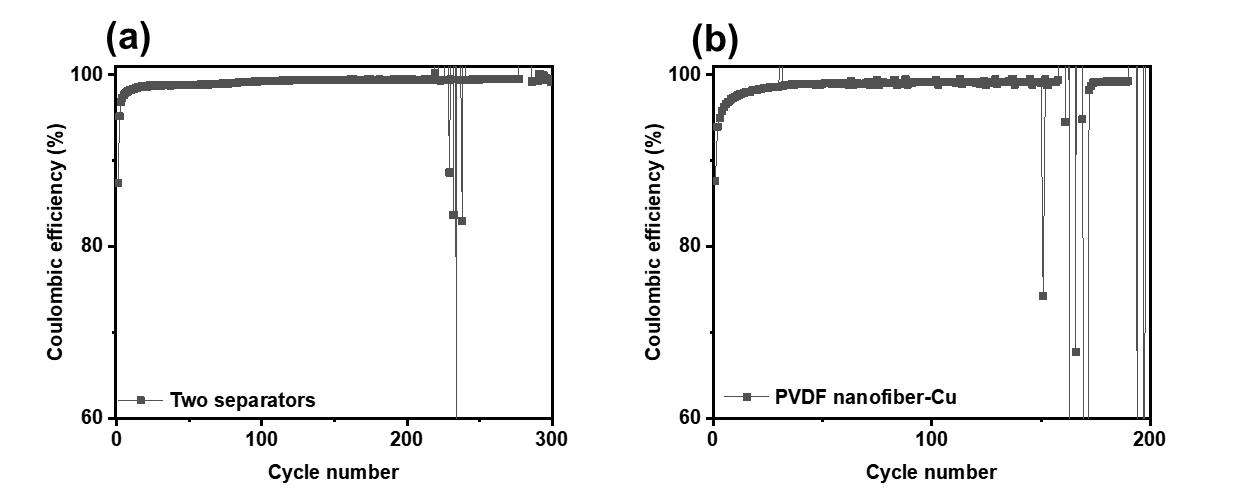
**Figure S5.** Top-view SEM images of Zn deposition morphology on (a-d) bare Cu electrode and (e-h) PNF-Cu under various current densities.



**Figure S6.** Top-view SEM image of glass fiber.



**Figure S7.** Top-view SEM images of Zn deposition morphology of Zn‖Cu cell using two glass fibers as a separator.



**Figure S8.** Coulombic efficiencies of long-term cycles at 1 mA cm-2 of the (a) Zn‖Cu half cell using 2 separators and (b) Zn‖PVDF-Cu half cell.

**Table S1.** Comparison table for the electrochemical performances by various materials used for surface modification of Zn anode.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Materials** | **Areal capacity**  **(mA h cm−2)** | **Current density**  **(mA cm−2)** | **Coulombic**  **Efficiency**  **(%)** | **Cycle number** | **Reference** |
| PNF | 1 | 1 | 99.2 | 300 | Present work |
| Nafion Zn-X | 2 | 0.2 | 97 | 130 | 1 |
| nanoAu | 0.5 | 0.5 | 97.1 | 60 | 2 |
| PA layera | 0.4 | 0.4 | 97.43 | 300 | 3 |
| Cu/Zn | 0.5 | 5 | 91.8 | 100 | 4 |
| β-PVDF | 0.18 | 0.36 | ~ 96.5 | 200 | 5 |
| Sc2O3 | 0.56 | 1.13 | 99.85 | 260 | 6 |
| ZnO | 0.5 | 2 | 99.55 | 300 | 7 |
| 502 glue | 1 | 2 | 99.74 | 200 | 8 |
| ZnF2 | 1 | 5 | 99.5 | 1000 | 9 |
| Sn | 1 | 1 | ~ 99 | 250 | 10 |
| NCLTib | 1 | 2 | 99.0 | ~700 | 11 |
| Mg-Al LDHc | 1 | 10 | 99.2 | 2000 | 12 |
| PDMS/TiO2-xd | 0.5 | 0.5 | ~ 99.4 | 450 | 13 |
| CG separatore | 1 | 1 | 98.68 | 100 | 14 |
| N-Cf | 2 | 2 | 98.76 | 120 | 15 |
| BaTiO3 | 1 | 1 | / | 120 | 16 |
| ZnP | 0.5 | 2 | 99.5 | 200 | 17 |
| ZnS | 1 | 2 | 99.2 | 200 | 18 |
| CNGg | 1 | 0.5 | 99.4 | 300 | 19 |

*aPolyamide (PA), bNiCo layered double hydroxides (NCLTi), cMg-Al layered double hydroxide (Mg-Al layered double hydroxide), dPoly(dimethylsiloxane) (PDMS), eCellulose nanofibers and graphene oxide (CG), fConductive and defective N-doped carbon (N-C), gCelluose nanowhisker-graphene (CNG).*

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