Supporting Information

A core–shell structured polyacrylonitrile@poly(vinylidene fluoride-hexafluoro propylene) microfiber complex membranes as a separator by co-axial electrospinning

Shuting Yang [abc], Wenhao Ma [abc], Aili Wang [abc], Jifeng Gu [abc] andYanhong Yin [abc]*

[a] School of Chemistry and Chemical Engineering, Henan Normal University, Xinxiang Henan 453007, P. R. China.

[b] National & Local Joint Engineering Laboratory for Motive Power and Key Materials Xinxiang, Henan 453007, China.

[c] Collaborative Innovation Center of Henan Province for Motive Power and Key Materials, Xinxiang, Henan 453007, China.

* Corresponding Author: E-mail: yyh3326439@foxmail.com (Y.H. Yin)

In order to demonstrate improvement obtained with the mixture material as compared to pure PAN and pure PVDF-HFP, some experiments were carried out. (The pure PAN and PVDF-HFP membranes were fabricated with a single needle at a flow rate of 0.10mm/min with a potential difference of 20 kV)

Table S1. Porosity and electrolyte uptake of PE, PAN, PVDF-HFP and PAN@PVDF-HFP.

Sample	PE	PAN	PVDF-HFP	PAN@PVDF-HFP
Porosity (%)	35	73	70	75
Electrolyte uptake (%)	130	405	450	420

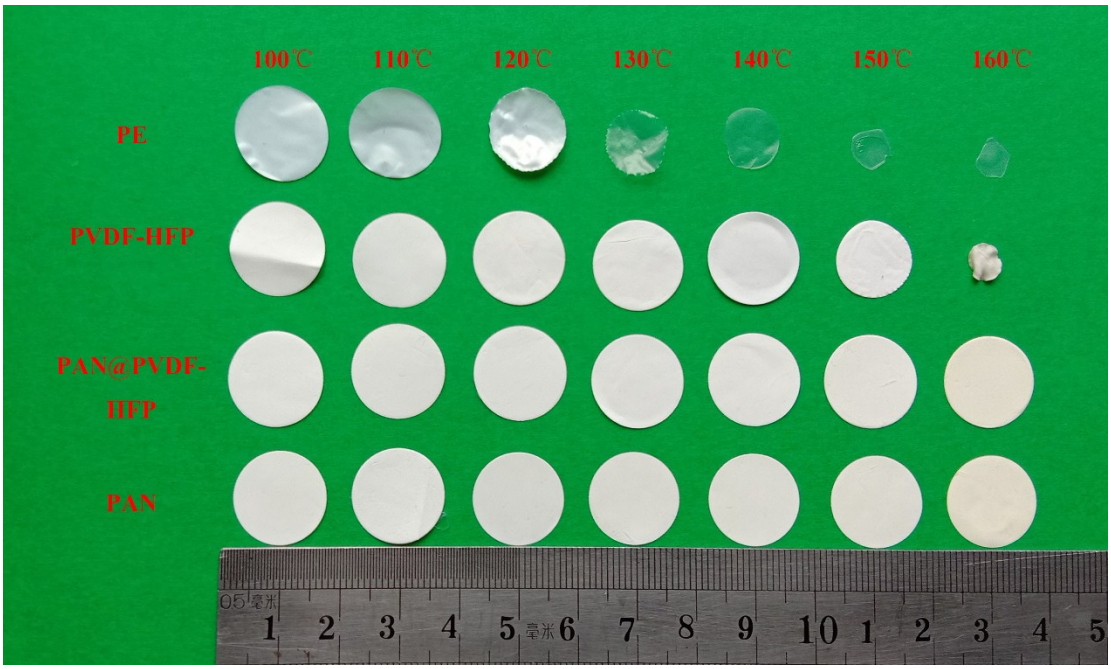

Figure S1. Photograph of the PE, PVDF-HFP, PAN@PVDF-HFP and PAN membrane after heating at different temperatures for 30min.

The thermal shrinkage of pure PAN is better than that of PVDF-HFP and PE. After the combination of PAN and PVDF-HFP, the thermal shrinkage performance is obviously improved.

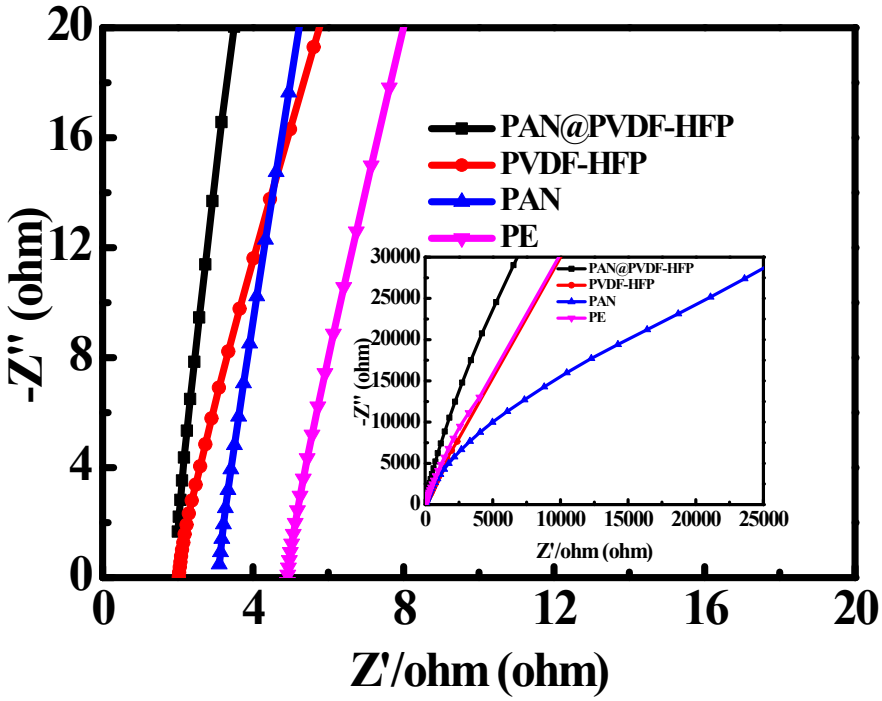

Figure S2. Nyquist plots of the batteries (SS/separator/SS) for the liquid electrolyte-soaked porous PE, PVDF-HFP, PAN@PVDF-HFP and PAN membrane.

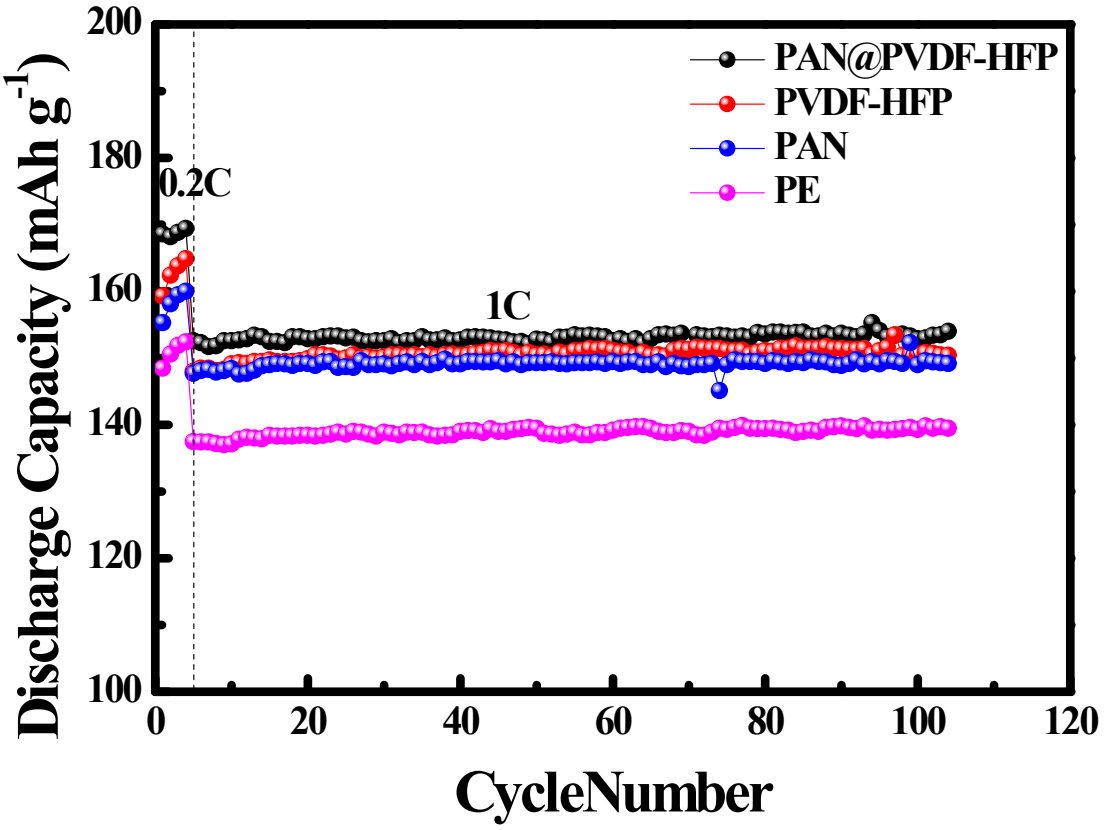

Figure S3. Cycle performance of Li/LiFePO4 batteries with PAN@PVDF-HFP, PVDF-HFP, PAN and PE membrane.

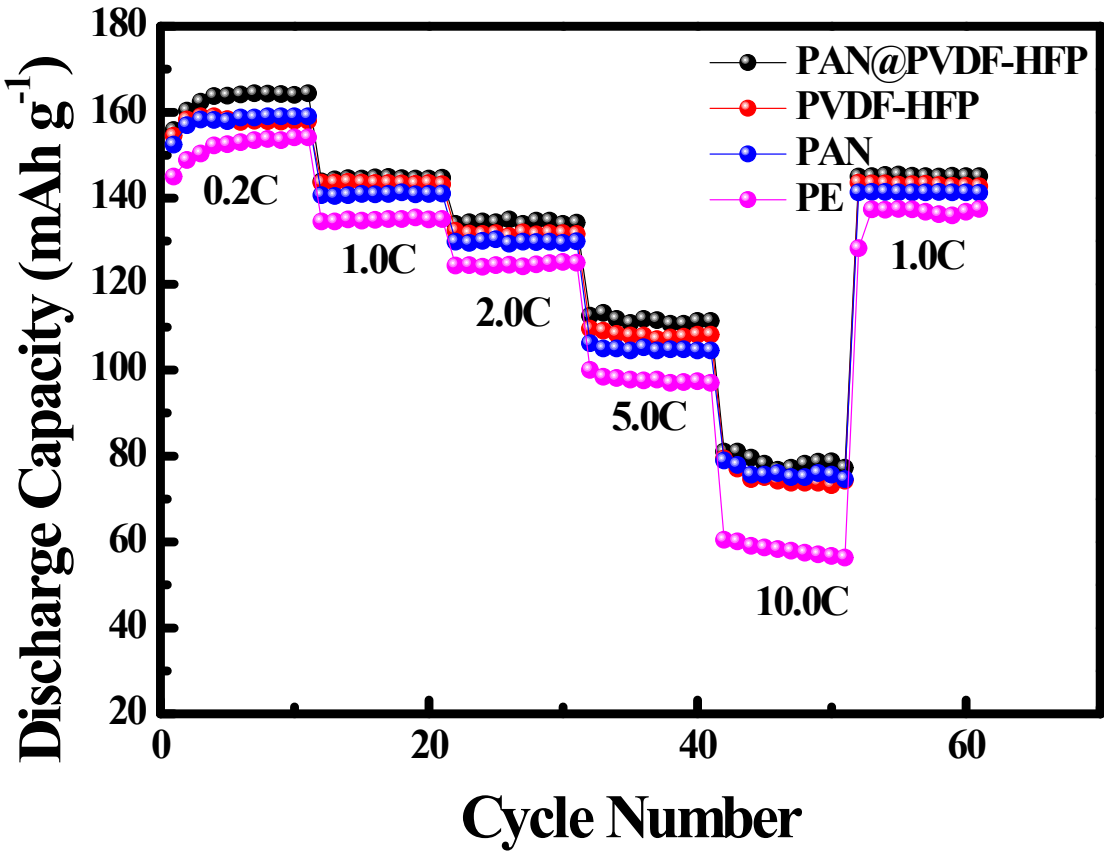

Figure S4. C-rate performance of Li/LiFePO4 batteries with PAN@PVDF-HFP, PVDF-HFP, PAN and PE membrane.