

Rapid Formation of Polyimide Nanofiber Membranes via Hot-Press Treatment and Their Performance as Li-Ion Battery Separators

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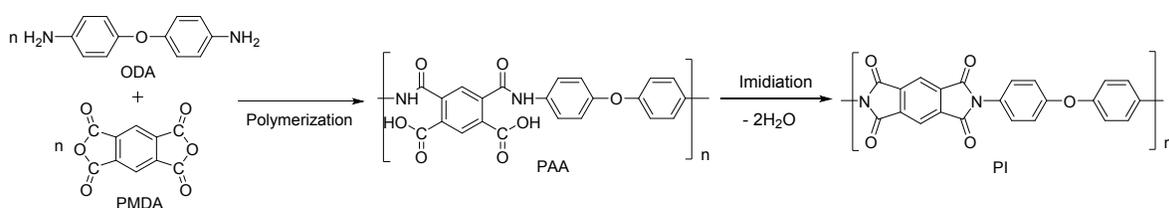
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Preparation of PAA nanofibers and their conversion to PI membranes under various conditions



Scheme S1. The formation of PAA and PI.

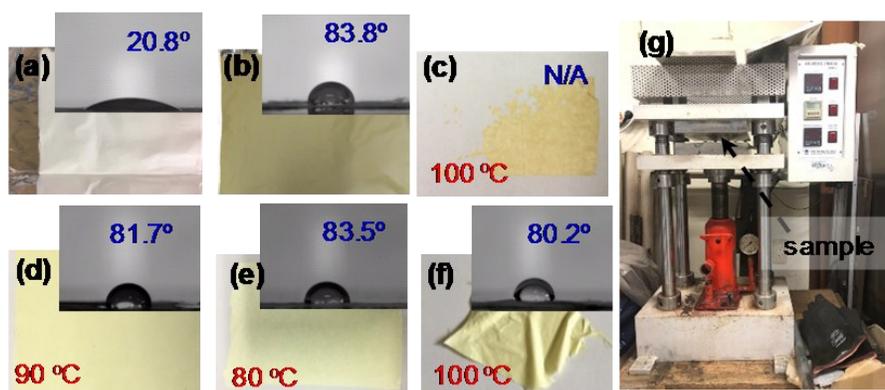


Figure S1. PI membranes formed from (a) PAA nanofiber sheets (b) prepared by typical heat treatments at 100 °C/2 h, 200 °C/2 h, and 300 °C/2 h; (c) hot-pressed with paper substrates at 100 °C or higher temperatures; (d) 90 °C; (e) 80 °C under 3000 psi; (f) hot-pressed at 100 °C using glass substrates; (g) hot-press machine

Table S1. Test conditions for the capacity of the coin cells

Mode	Conditions
1. Charging (CCCV)	39 mA to 4.2V cut off: 6.5 mA
2. Rest	30 min
3. Recharging (CC)	26 mA to 3.0 V
4. Rest	30 min
5. Cycle	No.1~No.4 / 2 cycle

CC: Constant Current, CV: Constant Voltage

Table S2. Charging and discharging conditions for the C-rate test of the coin cells

Capacity	Charging conditions	Discharging conditions
0.1C	CCCV:39 mA to 4.2V cut off :6.5 mA	CC:13 mA to 3V
0.2C	CCCV:39 mA to 4.2V cut off :6.5 mA	CC:26 mA to 3V
1C	CCCV:39 mA to 4.2V cut off :6.5 mA	CC:130 mA to 3V
2C	CCCV:39 mA to 4.2V cut off :6.5 mA	CC:260 mA to 3V
3C	CCCV:39 mA to 4.2V cut off :6.5 mA	CC:390 mA to 3V
5C	CCCV:39 mA to 4.2V cut off :6.5 mA	CC:650 mA to 3V

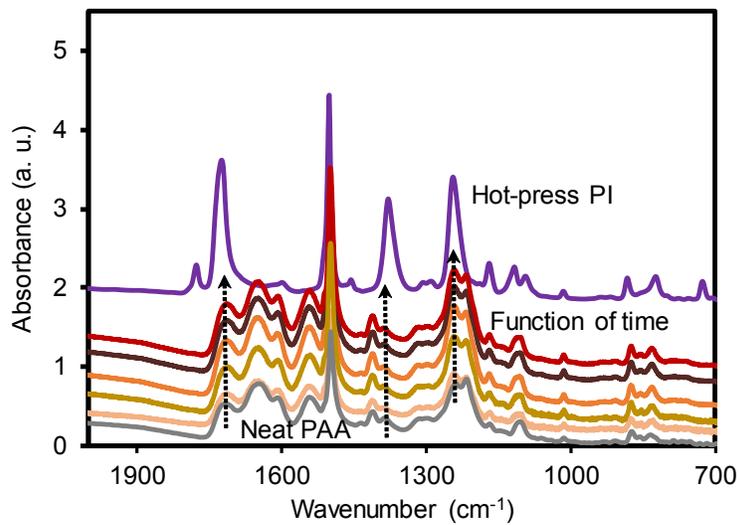


Figure S2. FT-IR spectra of PAA nanofiber membrane stored at room temperature as a function of time.

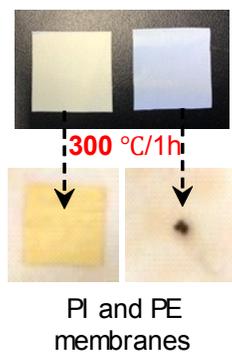


Figure S3. Digital photos of PI and PE membranes before and after the thermal shrinkage test at 300 °C for 1 h.

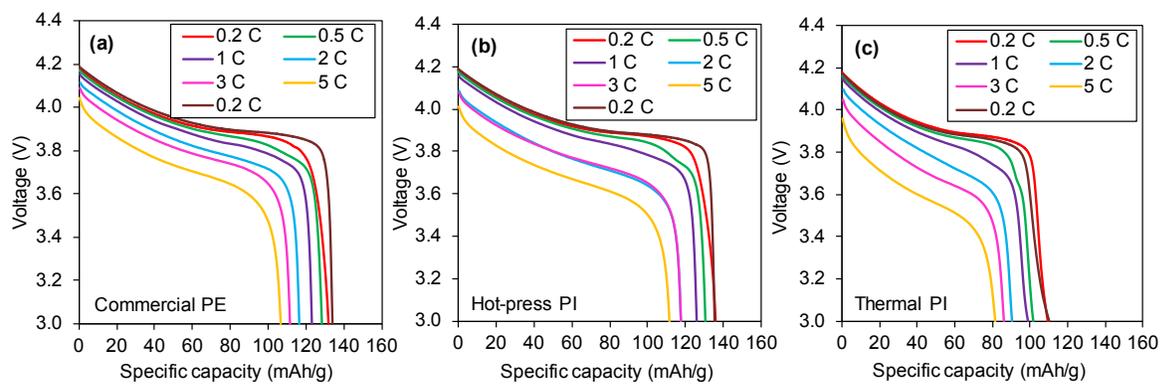


Figure S4. Discharge voltage profiles of the full coin cells with three different separators as a function of the C-rate.