

## Supporting information

### Supplementary Materials

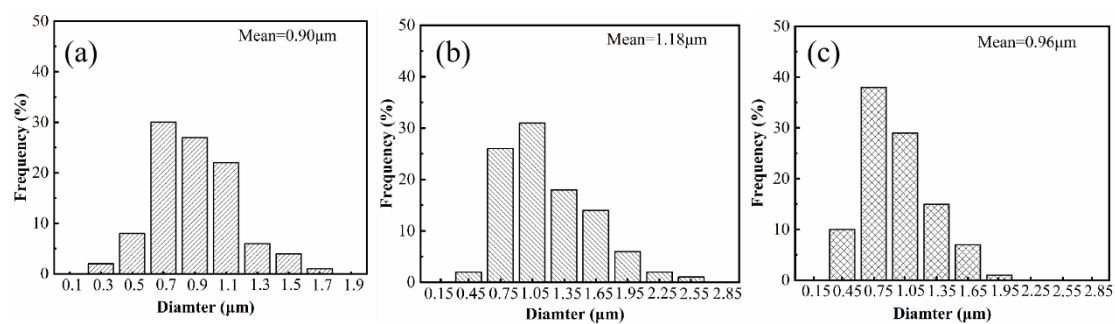


Figure S1. Pore size distributions of (a) PM-10, (b) PM-30, and (c) PM-50 membranes.

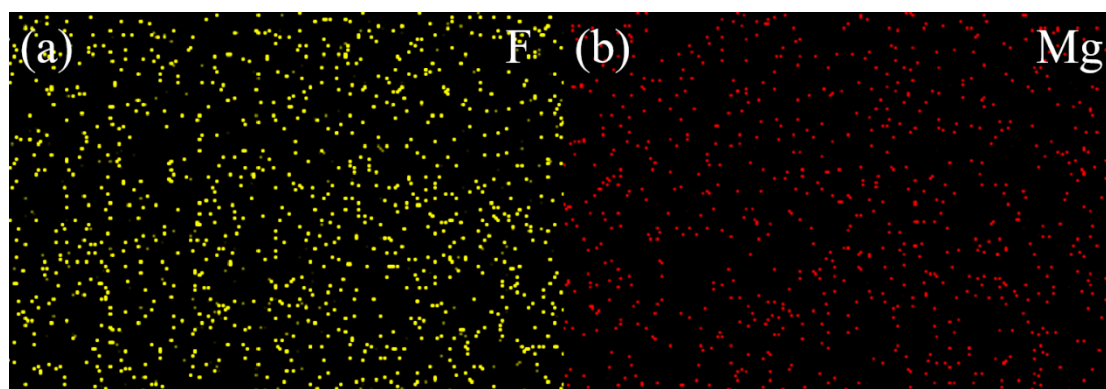


Figure S2. EDS mapping of PM-50 membranes with F and Mg elements.

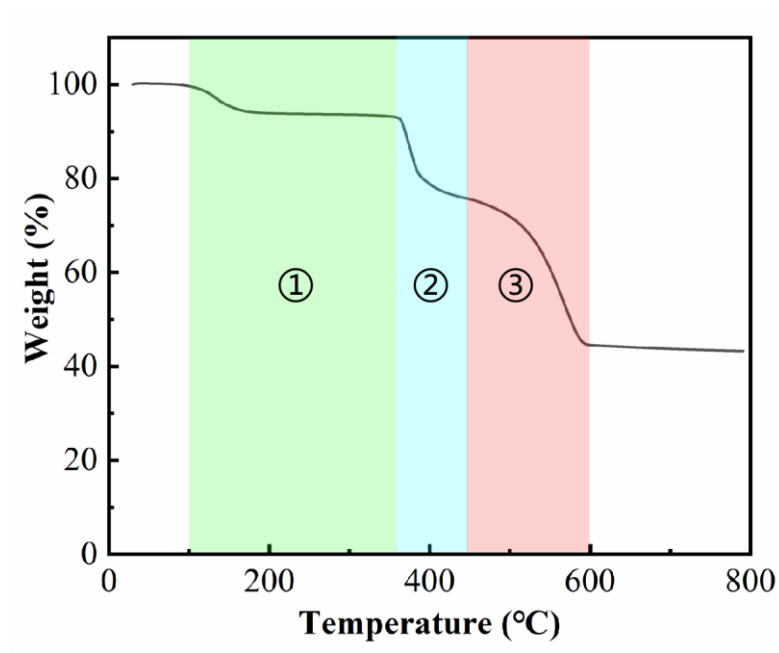


Figure S3. TG curve of MCH nanofibers.

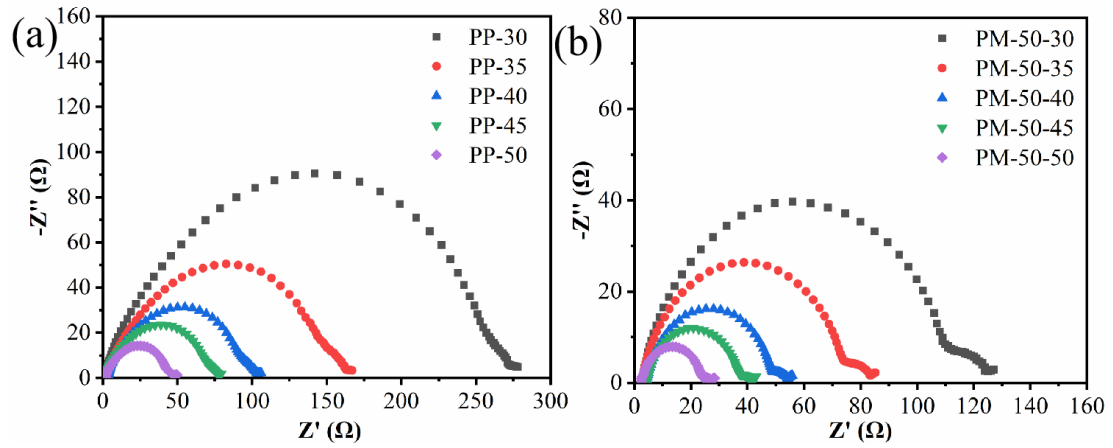


Figure S4. The charge transfer resistances ( $R_{ct}$ ) at different temperatures of symmetric Li/Li cells with (a) PP and (b) PM-50 membranes.

Table S1. The specific values for lithium ion transference number calculation

cell	$I_0$ ( $\mu\text{A}$ )	$I_s$ ( $\mu\text{A}$ )	$R_0$ ( $\Omega$ )	$R_s$ ( $\Omega$ )	$\Delta V$ (V)	$t_{\text{Li}^+}$
Li/PP/Li	70.7	66.4	255.6	328.7	0.01	0.64
Li/PM-50/Li	94.2	84.5	229.9	270.5	0.01	0.81