Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Enhancing ionic conductivity and mechanical properties of PEO-based solid electrolytes through thermal pre-stretching treatment

Supplementary Information

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To determine the optimal pre-strain magnitude of PL and PLL via thermal stretching, we conducted a quasi-static uniaxial tensile test on solid electrolyte samples using a universal testing machine (C610M, Labthink) equipped with an Ar-filled environmental chamber at 60℃. The resulting tensile curve is depicted in Figure S1.

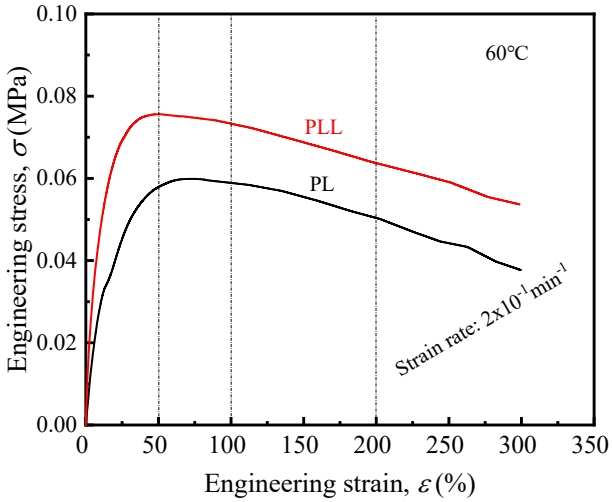

Fig. S1 Tensile stress-strain curve for PEO-based solid electrolytes at 60℃

Fig. S2(a-m) presents the Nyquist plots for PL, PLL and PLT solid electrolytes with the prestrain of 0-200% at 20℃, 30℃, 40℃ and 50℃, respectively.

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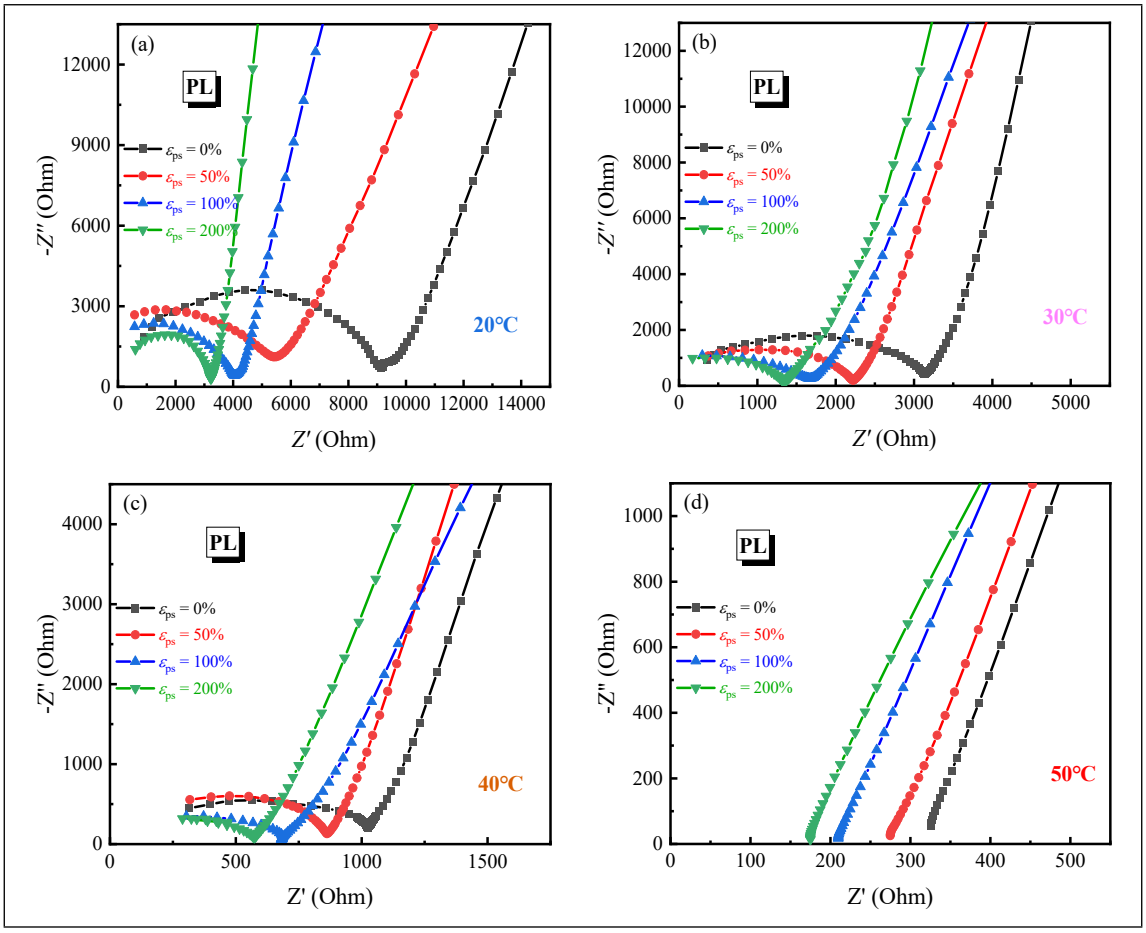
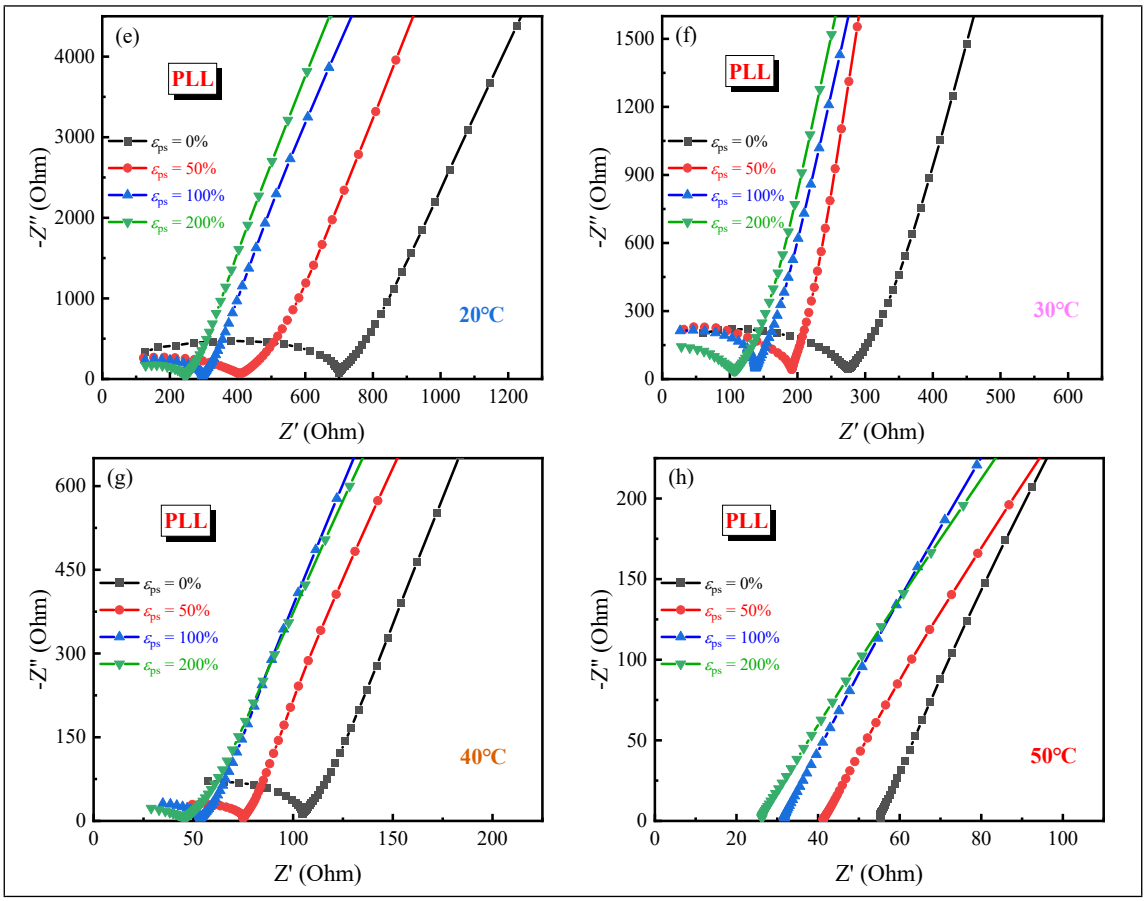

(a)
PL
ε_{ps} = 0%
ε_{ps} = 50%
ε_{ps} = 100%
ε_{ps} = 200%
20°C
-Z'' (Ohm)
Z' (Ohm)
(b)
PL
30°C
(c)
PL
40°C
(d)
PL
50°C


(e)
PLL
ε_{ps} = 0%
ε_{ps} = 50%
ε_{ps} = 100%
ε_{ps} = 200%
20°C
-Z'' (Ohm)
Z' (Ohm)
(f)
PLL
30°C
(g)
PLL
40°C
(h)
PLL
50°C

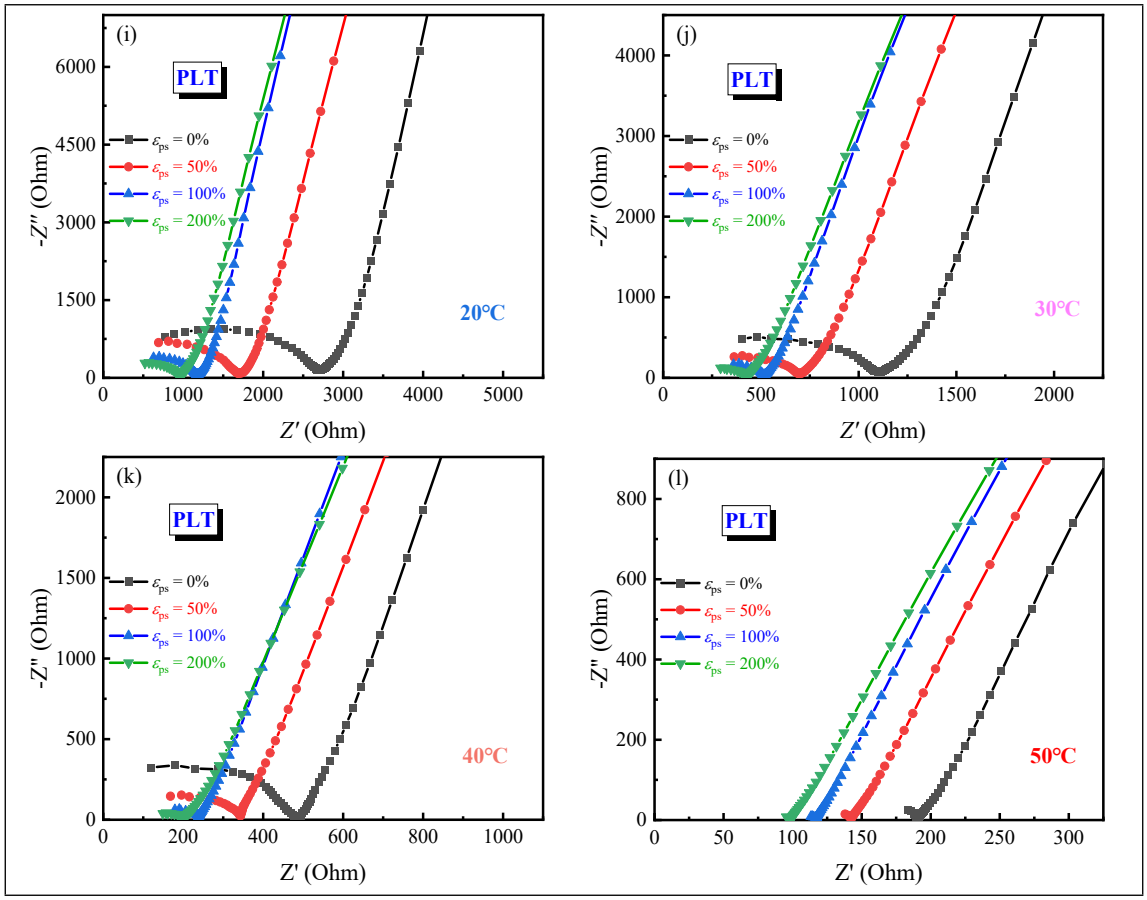


Fig. S2 Nyquist plots for (a-d) PL, (e-h) PLL and (i-l) PLT solid electrolytes with different pre-strain at 20°C, 30°C, 40°C and 50°C, respectively.