## **Supporting information**



Figure S1 - (a) Schematic representation of composite electrolyte by using electrospinning method and (b) recent literature on composite electrolyte based on electrospinning method.

Figure S1.



Figure S2 - (a) Schematic representation of composite electrolyte by using electrospinning method and (b) recent literature on composite electrolyte system using Li<sup>+</sup> ion conductive ceramic–polymer electrolyte

Figure S2.



Figure S3 - XRD measurement of LATP from 950  $^{\rm o}{\rm C}$  to 1050  $^{\rm o}{\rm C}$ 





Figure S4 - The SEM images of LATP after sintering from (a-c) 1050 °C, (d-f) 1100 °C

Figure S4.



Figure S5 - Cyclability performance data for 20 cycles of all solid-state cells; (a) unit cell, (b) bipolar stacked cell

Figure S5



Figure S6 - The reconstructed 3D microstructure of FSCEF (sample size: x= 55  $\mu$ m, y = 30  $\mu$ m, z = 30 $\mu$ m)

## Figure S7



Figure S7 - The SEM images of FSCEF after bending 50 times by using (a) 50- and (b) 20-mm diameter cylinders with radii of curvature of 25 and 10mm, respectively.