(Supplementary Information)

Li_2SnO_3 Li-ion Hybrid Supercapacitors Converted from Pastes Containing LiCl-$SnCl_2$ Liquid Precursor Using an Atmospheric-Pressure Plasma Jet

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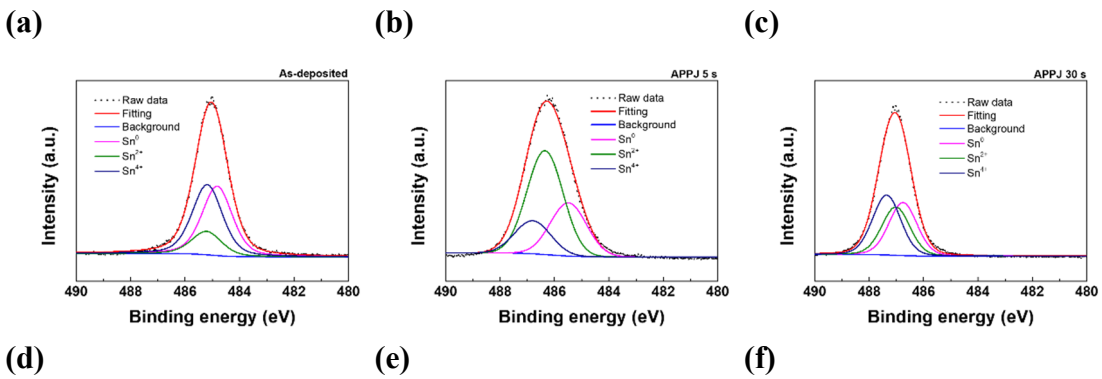
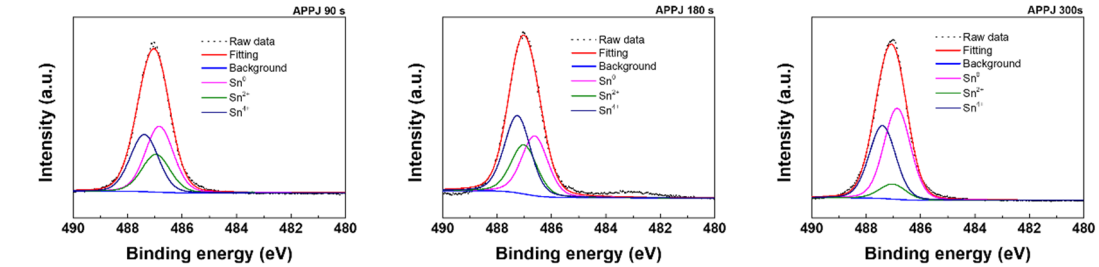




(g)

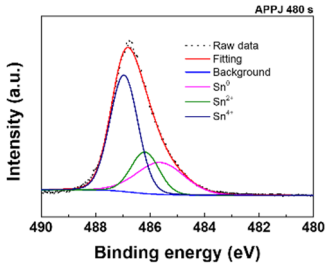
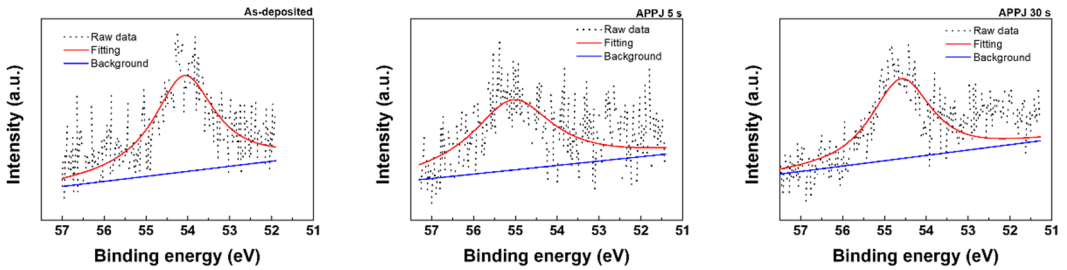


Figure S1 O1s fine-scan spectra of Li_2SnO_3 electrodes processed by APPJ for (a) 0 s, (b) 5 s, (c) 30 s, (d) 90 s, (e) 180 s, (f) 300 s, and (g) 480 s.

Table S1 Bonding contents obtained from XPS analysis of $Sn3d^{5/2}$.

	Sn^{0+} (at. %)	Sn^{2+} (at. %)	Sn^{4+} (at. %)
As-deposited	40.41	17.67	42.92
APPJ 5 s	32.10	41.54	26.36
APPJ 30 s	32.92	29.95	37.13
APPJ 90 s	41.27	23.64	35.09
APPJ 180 s	27.98	54.64	17.38
APPJ 300 s	50.91	8.39	40.70
APPJ 480 s	25.58	19.57	54.85

(a) **(b)** **(c)**



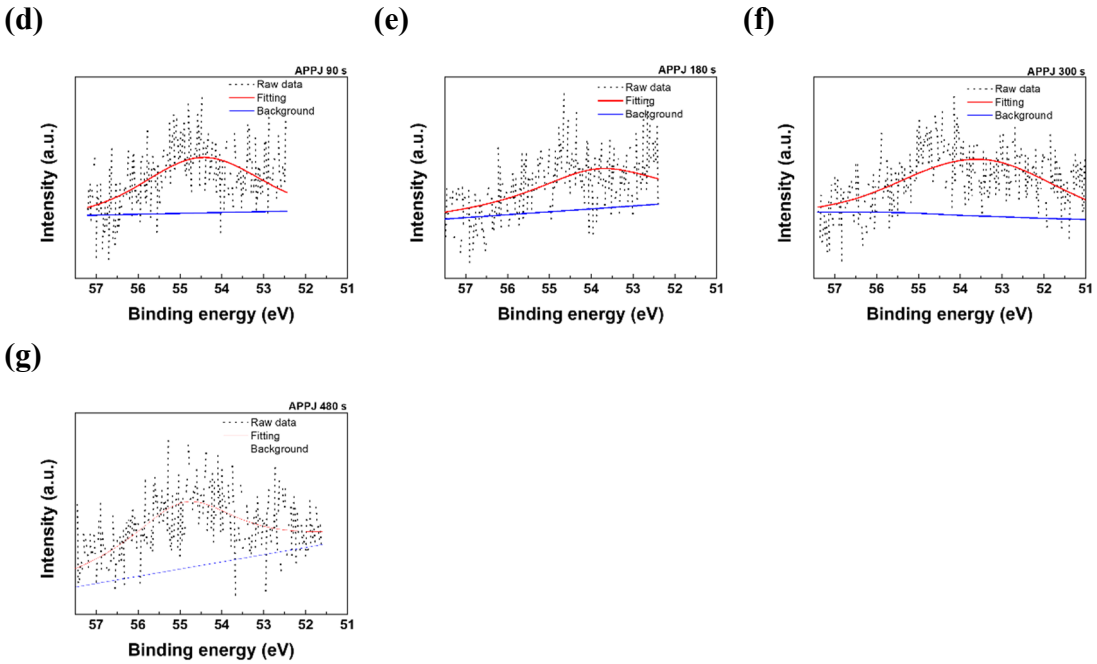


Figure S2 Li1s fine-scan spectra of Li_2SnO_3 electrodes processed by APPJ for (a) 0 s, (b) 5 s, (c) 30 s, (d) 90 s, (e) 180 s, (f) 300 s, and (g) 480 s.

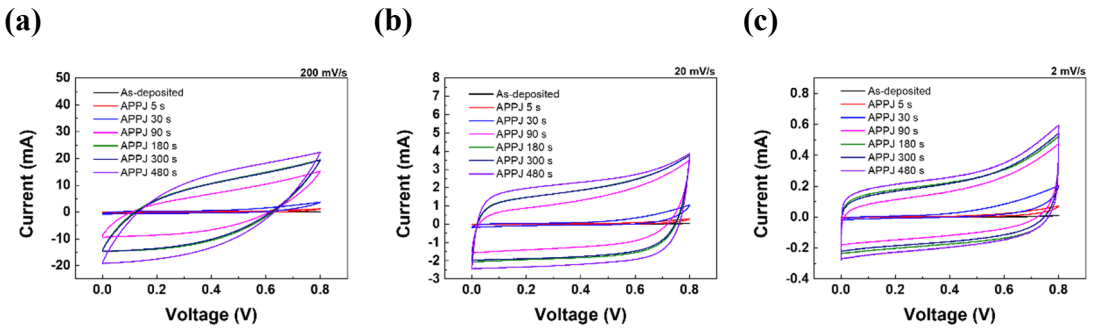


Figure S3 CV curves for Li_2SnO_3 Li-HSCs under potential scan rates of (a) 200 mV/s, (b) 20 mV/s, and (c) 2 mV/s in two-electrode symmetric system.

Table S2 Areal capacity of Li_2SnO_3 Li-HSCs calculated based on CV results in two-electrode symmetric system.

	Areal capacity (mC/cm^2)		
Potential scan rate	**200 mV/s**	**20 mV/s**	**2 mV/s**

As-deposited	0.032	0.081	0.096
APPJ 5 s	0.432	0.616	1.128
APPJ 30 s	2.080	2.813	4.880
APPJ 90 s	13.440	32.096	38.504
APPJ 180 s	20.688	38.064	45.752
APPJ 300 s	21.512	44.936	50.888
APPJ 480 s	25.681	55.664	61.584

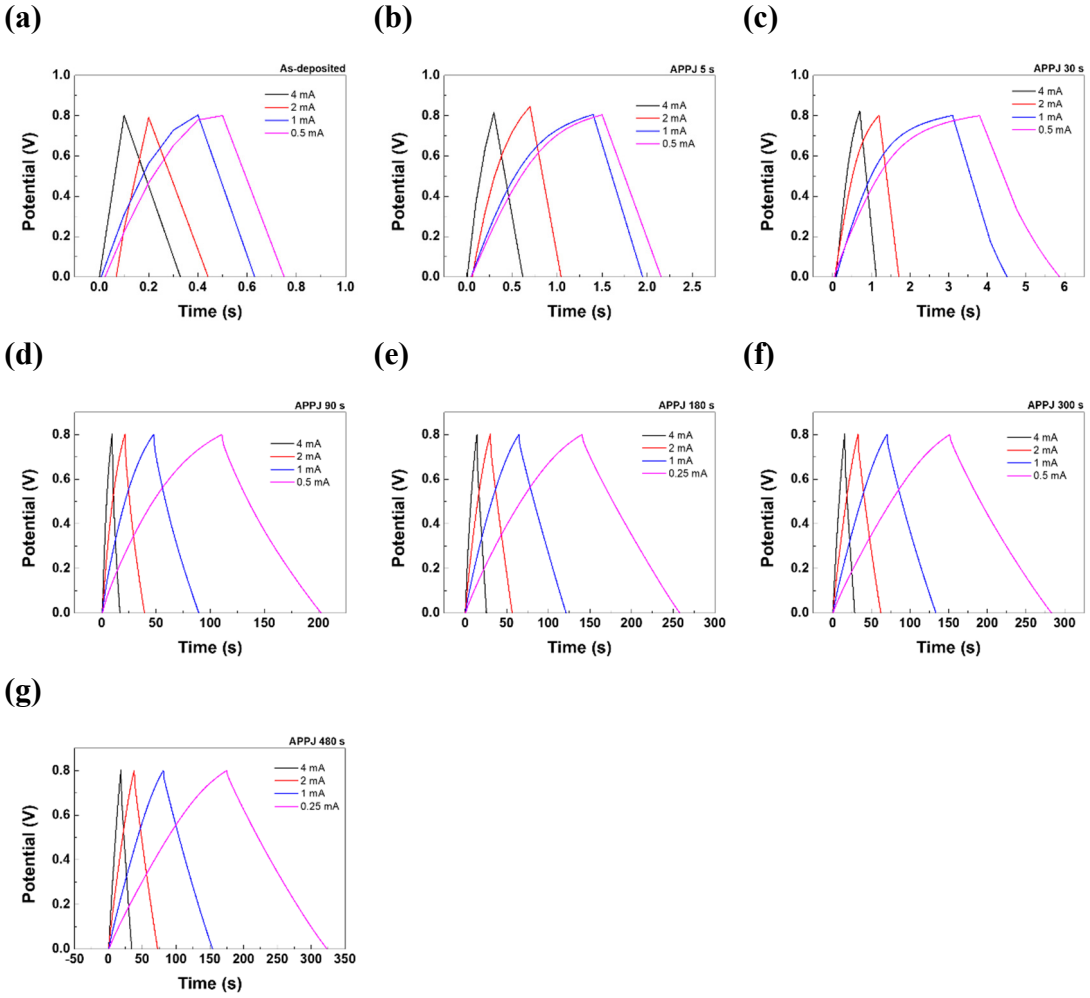


Figure S4 GCD curves of (a) untreated Li-HSCs and Li-HSCs processed by APPJ for (b) 5 s, (c) 30 s, (d) 90 s, (e) 180 s, (f) 300 s, and (g) 480 s.

Table S3 Areal capacity of Li_2SnO_3 Li-HSCs calculated based on GCD results in two-electrode symmetric system.

Areal capacity (μA h/cm^2)				
Charging/ Discharging current	**4 mA**	**2 mA**	**1mA**	**0.5 mA**
As-deposited	0.082	0.169	0.189	0.253
APPJ 5 s	0.087	0.171	0.338	0.462
APPJ 30 s	0.201	0.273	0.344	0.682
APPJ 90 s	5.369	6.687	7.729	8.493
APPJ 180 s	8.580	9.778	10.509	11.101
APPJ 300 s	9.671	10.924	11.751	12.204
APPJ 480 s	11.776	12.847	13.516	13.973

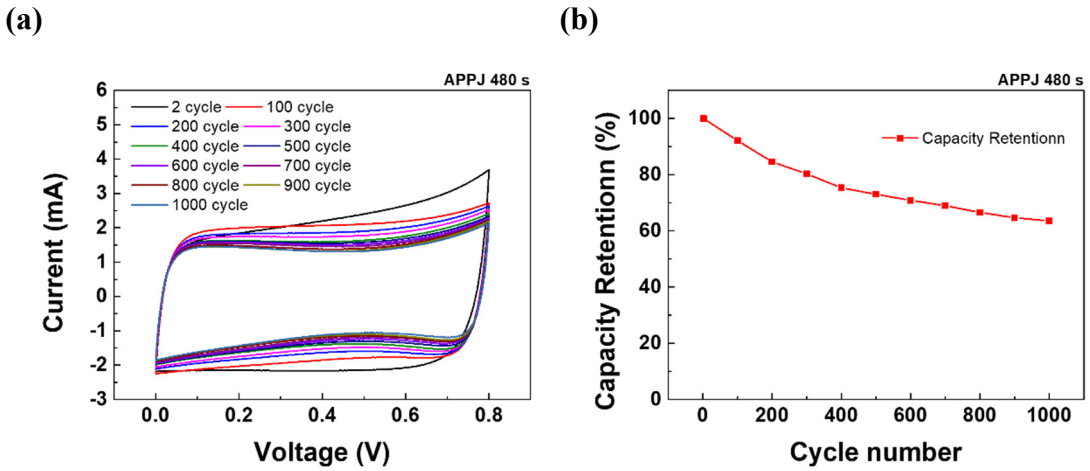


Figure S5 Representative cycling stability curves of Li_2SnO_3 Li-HSCs processed by APPJ for 480s in two-electrode symmetric system.

Table S4 Capacity retention rate of Li_2SnO_3 Li-HSCs in two-electrode symmetric system.

Cycle number	Capacity Retention (%)
2	100
100	92.16
200	84.59
300	80.29
400	75.34
500	73.02
600	70.90
700	68.99
800	66.57
900	64.69
1000	63.56