Energy Materials

Supplementary Material

Porous array of $BaLi_4$ alloy microchannels enforced carbon cloth for a stable Li composite anode

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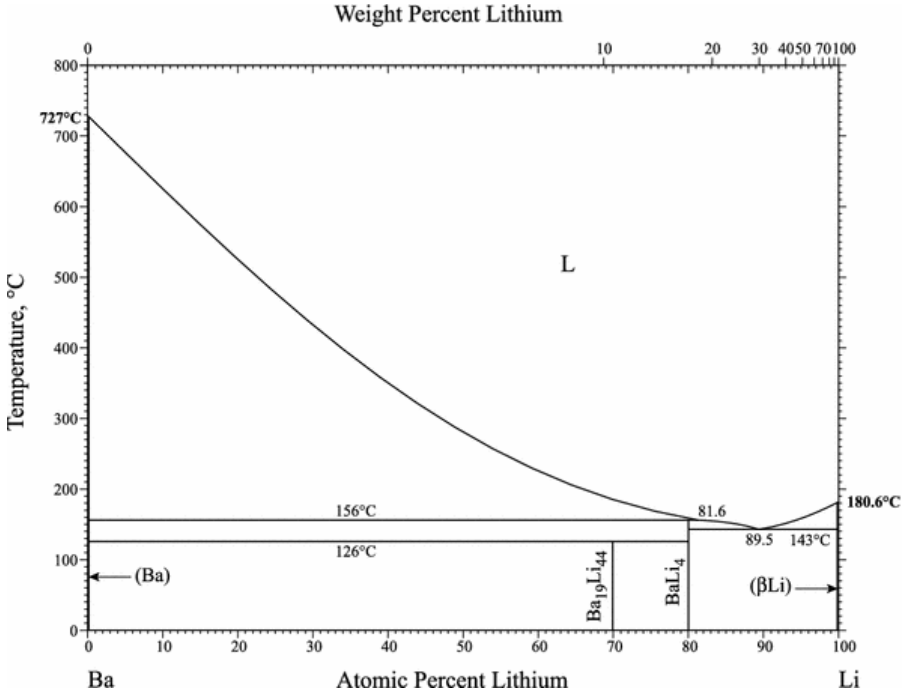
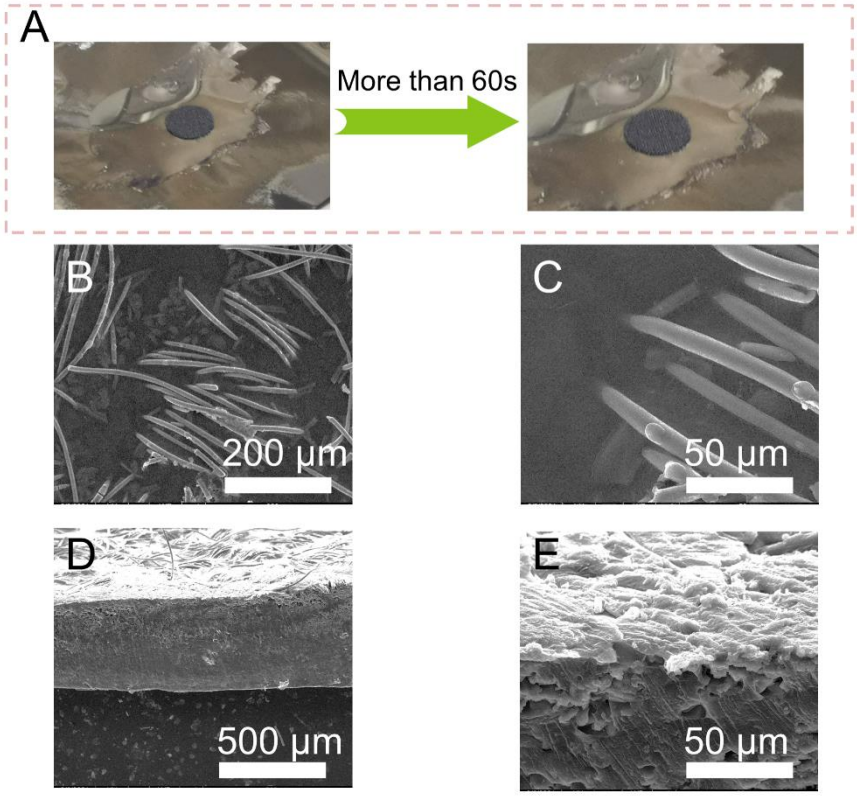
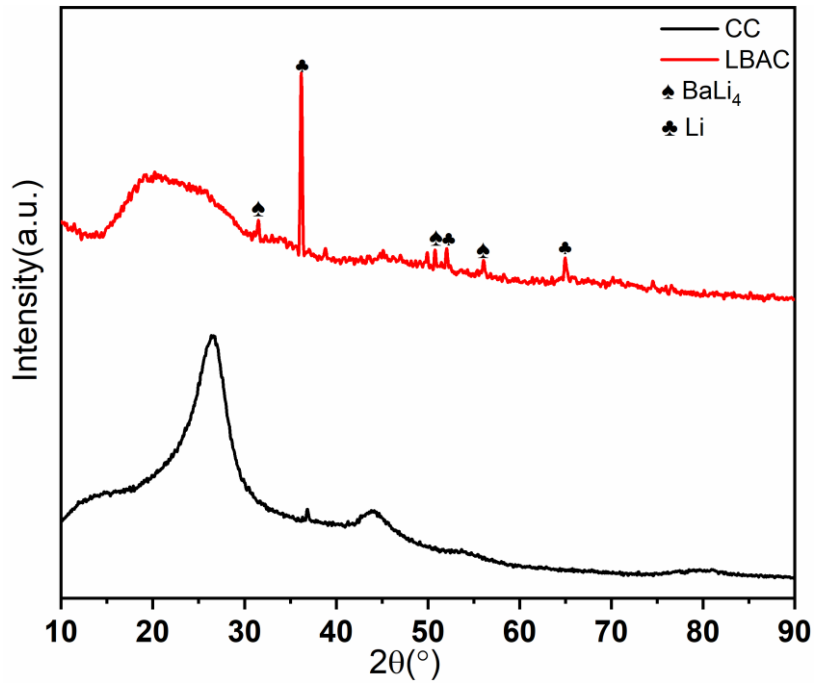


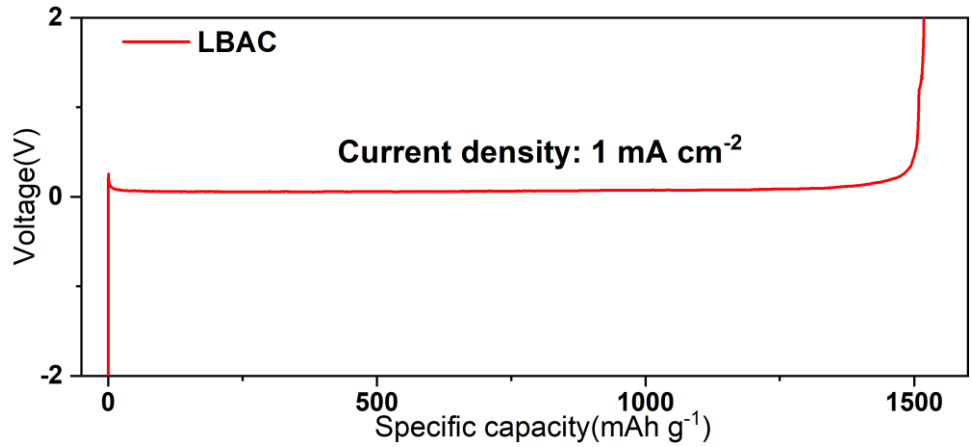
Supplementary Figure 1. Li-Ba phase diagram[1]



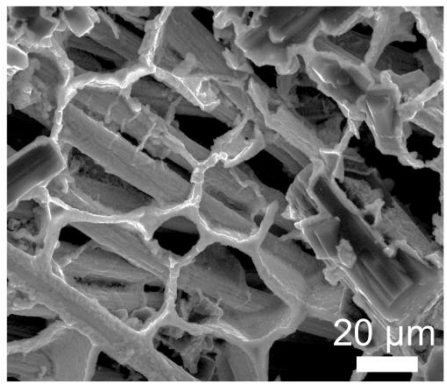
Supplementary Figure 2. (A) The images of liquid Li infusion process on the CC at 400 ºC. The (B, C) top-view and (D, E) side-view SEM images of the Li-C.



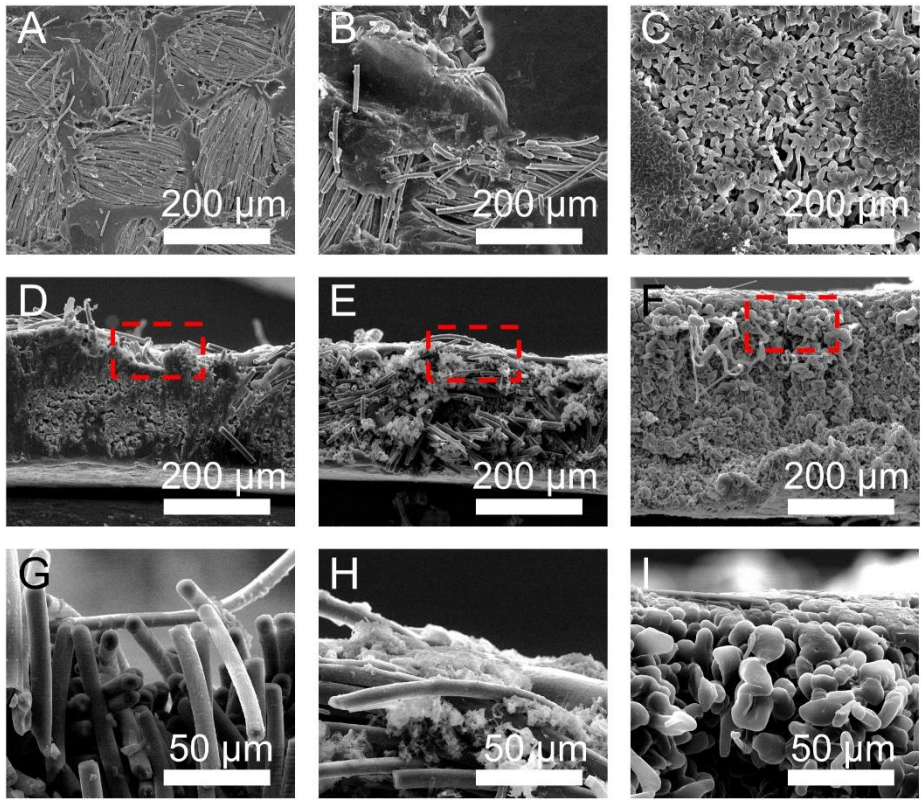
Supplementary Figure 3. The XRD pattern of the LBAC.



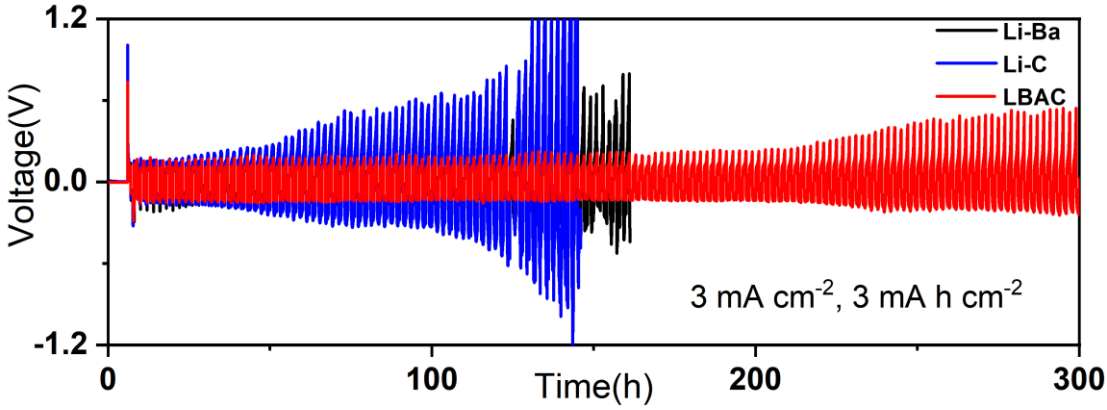
Supplementary Figure 4. Voltage profile of stripping Li from LBAC electrode to 2 V versus Li^+/Li.



Supplementary Figure 5. The top-view SEM image of LBAC electrode after stripping 20 mAh cm^{-2} Li.



Supplementary Figure 6. The top-view SEM images of Li-C electrode after (A) stripping 10 mA h cm^{-2} Li, (B) plating 5 mA h cm^{-2} Li back and (C) plating 10 mA h cm^{-2} Li back. The side-view SEM images of Li-C electrode (D, G) stripping 10 mA h cm^{-2} Li, (E, H) plating 5 mA h cm^{-2} Li back and (F, I) plating 10 mA h cm^{-2} Li back.



Supplementary Figure 7. Electrochemical characterization of symmetric cells at charge/discharge of 3 mAh cm^{-2} and 3 mA cm^{-2}.

Supplementary Table 1. Data used to calculate theoretical specific capacity of LBAC electrode.

	Average quality (mg)	wt. (%)
LBAC	38.5	100
CC	9.5	24.5
Ba, from $BaLi_4$	12.8	33.2
Li, from $BaLi_4$ and metallic Li phases	16.2	42.3

LBAC theoretical specific capacity：$16.2 \div 38.5 \times 3860 \approx 1621$ mA h g^{-1}

Supplementary Table 2. Comparison of the LBAC anode in this work with other carbon-based scaffolds under carbonate electrolyte conditions reported in recent publications.

	Current density (mA cm^{-2})	Capacity of Li (mAh cm^{-2})	Time
C/SiNW/Li[2]	1	1	600 h
	3	1	200 h
CI[3]	1	1	450 h
	5	1	70 h
Li-C[4]	1	1	450 h
	3	1	120h
Li/C wood[5]	3	1	150 h
Li-Carbon[6]	1	1	500 h
Li-CF[7]	1	1	744 h

	3	1	120 h
This work	**1**	**1**	**1000 h**
	3	**1**	**420 h**
	3	**3**	**300 h**
	5	**1**	**220 h**

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