

## **Li<sub>4</sub>Ti<sub>5</sub>O<sub>12</sub> Nanosquares@ Ultrathin Carbon Nanofilms in a Large Scale with Enhanced Properties in Lithium-ion Batteries**

Yonglian Xiong,\* Yuwei Chen, Jun Yan, Quanhui Hou, Wei Liu

College of Automotive Engineering, Yancheng Institute of Technology, Yancheng Jiangsu 224051, China,.

\*Corresponding author Email: [serena77@126.com](mailto:serena77@126.com).

10

15

20

25

30

35

40

Tables

Table S1 Rate discharge performance of cells

| Discharge current | DA9               |           | DA10              |           |
|-------------------|-------------------|-----------|-------------------|-----------|
|                   | dis-capacity(mAh) | nC/0.5C % | dis-capacity(mAh) | nC/0.5C % |
| 0.5C              | 1087              | 100.0     | 1088              | 100.0     |
| 1C                | 1083              | 99.6      | 1084              | 99.6      |
| 5C                | 1074              | 98.8      | 1076              | 98.9      |
| 10C               | 1067              | 98.2      | 1067              | 98.1      |
| 15C               | 1062              | 97.7      | 1063              | 97.7      |
| 20C               | 1052              | 96.8      | 1054              | 96.9      |
| 25C               | 1033              | 95.0      | 1038              | 95.4      |
| 30C               | 1014              | 93.3      | 1023              | 94.0      |

5 Figure Captions

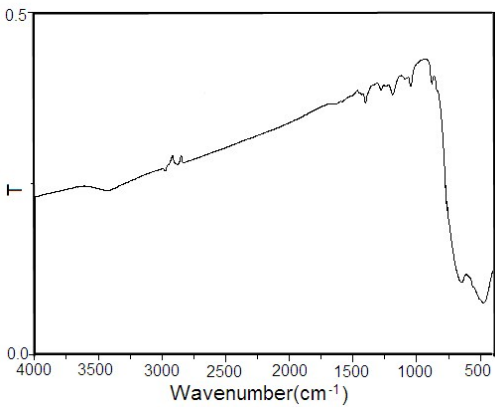


Fig.S1 The IR pattern of the C-LTO sample prepared at 800 °C for 6 h.

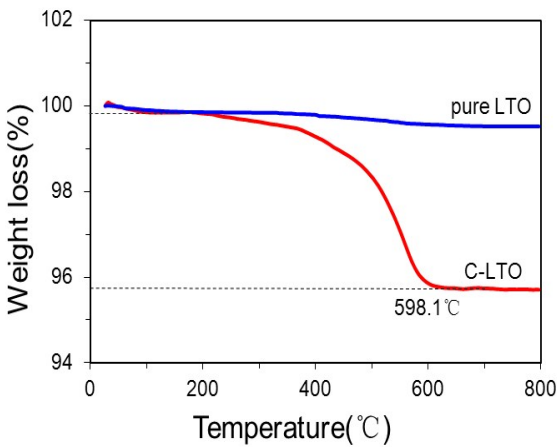


Fig.S2 TGA curve for pure LTO and C-LTO sample fabricated at 800 °C for 6 h.

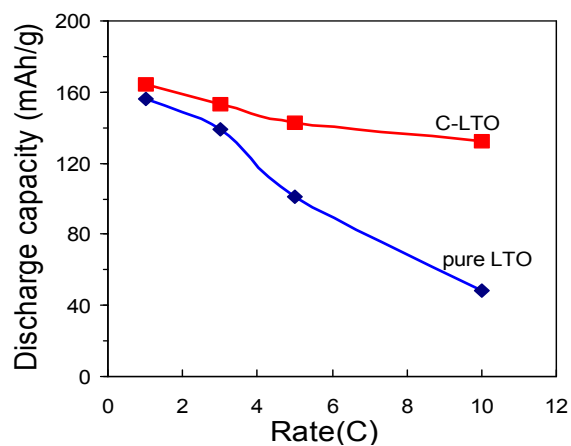


Fig. S3 The rate capabilities of C-LTO compared with pure LTO sample

5

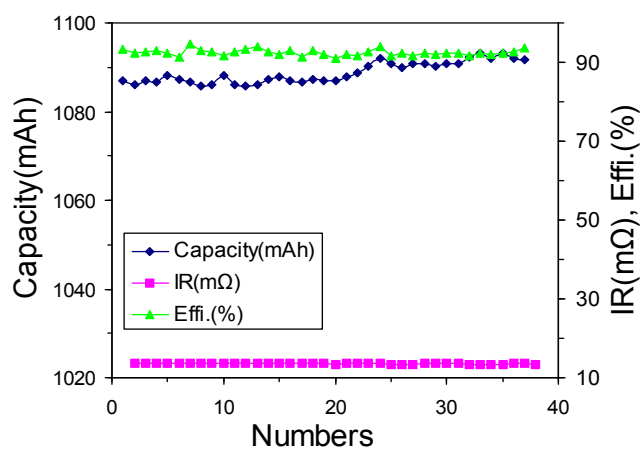


Fig. S4 The basic data of 18650-type cells with C-LTO at 800 °C for 6 h

10

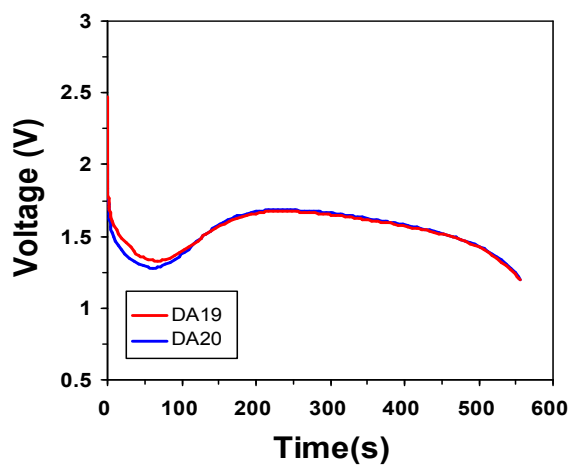


Fig. S5. Ultra-low temperature discharge performance at -40 °C, discharging to 1.2 V with 6 C current

15

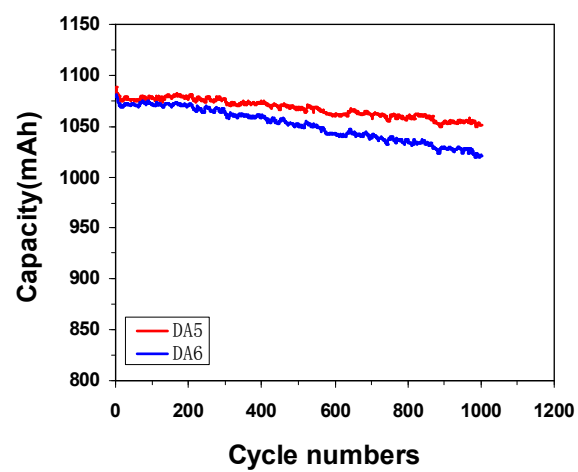


Fig. S6 Cycle performance of 18650-type battery with 5 C current at the room temperature in the range of 1.5-3V