**Addendum to “Fast Formation Cycling for Lithium Ion Batteries” [J.
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ABSTRACT

Detail experimental conditions are added for aging test and electrochemical impedance spectroscopy measurements.

1. Detail experimental conditions

There were 1300 cycles in the aging test from 26 repeating loops. Each loop included 49 cycles at 1C/-1C (Figures 4a and 4b in the original article) followed by 1 cycle at 0.2C/-0.2C. During the aging test, the cells were charged at 1C (or 0.2C at the end of each loop) until the voltage reached 4.2 V and then the voltage was held at 4.2 V until the current reached C/20. Then, the cells were discharged at -1C (or -0.2C at the end of each loop) until the voltage reached 2.5 V. For the discharge mode, no constant voltage phase was applied after the voltage reached 2.5 V. There was a rest step of 20 seconds between charge and discharge modes.

Electrochemical impedance spectroscopy (EIS) was taken 1 hour after every 25% depth-of-discharge (DOD). Before the EIS measurement, a cell was charged at C/3 until the voltage reached 4.2 V and rested at open circuit voltage (OCV) for 1 hour. C/3 discharge rates were used to adjust to 25% DOD. No constant voltage phase was applied for the DOD adjustment. Then, the cell rested at OCV for 1 hour before the EIS measurement. A rest step of 10 seconds was applied after each EIS measurement and before the DOD adjustment. Frequencies between 400 kHz to 10 mHz were used with 5 mV oscillation amplitudes. EIS data were recorded 6 points per decade.

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