

Supporting Information

Self-discharge rates in cells play critical effect on the cycle life of parallel lithium-ion batteries

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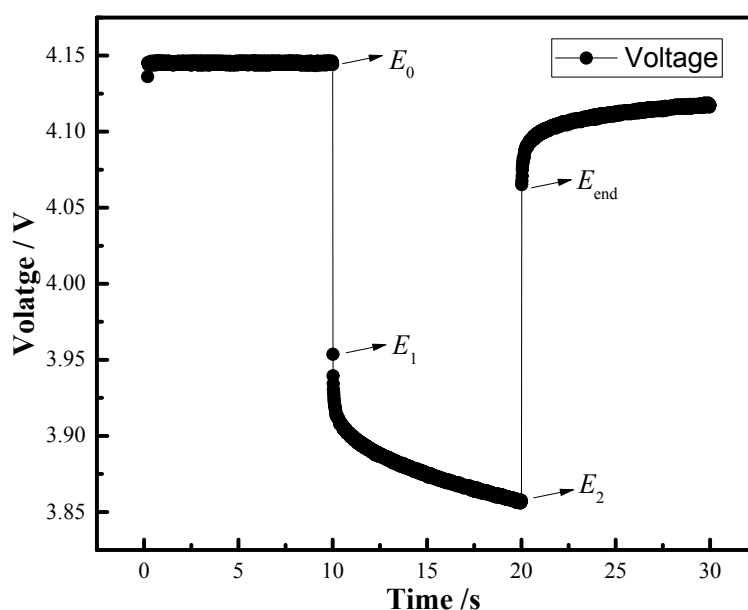


Fig. S1. Schematic representation of the DCR test

Table S1. Descriptive statistics of the total and experimental samples

Statistic	Total sample (100 cells)				Experimental sample (18 cells)			
	μ	σ	W*	P*	μ	σ	W	P
Capacity (Ah)	5.261	0.098	0.9887	0.6001	5.276	0.1076	0.9683	0.7656
DCR (mΩ)	30.07	0.9895	0.9791	0.132	30.41	1.118	0.9269	0.1713
OCV (V)	4.177	0.0031	0.9636	0.0097 < 0.05	4.173	0.00278	0.9481	0.3964
k_{OCV} (mV/d)	3.91	0.2435	0.9836	0.2836	3.748	0.6257	0.9194	0.126

*The Shapiro–Wilk test is a normality test for the sample features.

Table S2. Correlations between the initial variations

Correlation (r)	CV_Capacity	CV_DCR	CV_OCV	CV_ k_{OCV}
CV_Capacity	1	−0.122	−0.324	−0.301
CV_DCR	−0.122	1	0.694	0.368
CV_OCV	−0.324	0.694	1	0.624
CV_ k_{OCV}	−0.301	0.368	0.624	1

Table S3. T-test results for parameter estimates and F-test results for test effects based on stepwise regression

Statistic	50 cycles			100 cycles			150 cycles		
	t ratio	F	P> F,	t ratio	F	P> F,	t ratio	F	P> F,
		ratio	t		ratio	t		ratio	t
Capacity									
DCR	−2.21	4.8950	0.0779						
OCV	2.02	4.0672	0.0999						
k_{OCV}	2.29	5.2583	0.0704	1.98	3.9038	0.0887	2.15	4.6289	0.0685

Table S4. LSD threshold matrix for the samples with different levels of CV_ k_{OCV}

LSD threshold matrix	100 cycles			150 cycles		
	Level 1	Level 2	Level 3	Level 1	Level 2	Level 3
Level 1	−0.00622	−0.00358	0.00458	−0.00612	−0.00322	0.0043
Level 2	−0.00358	−0.00622	0.00194	−0.00322	−0.00612	0.0014
Level 3	0.00458	0.00194	−0.00622	0.0043	0.0014	−0.00612