# Direct Proof of Oxidation-and-Transport Processes within Li-ion Cells

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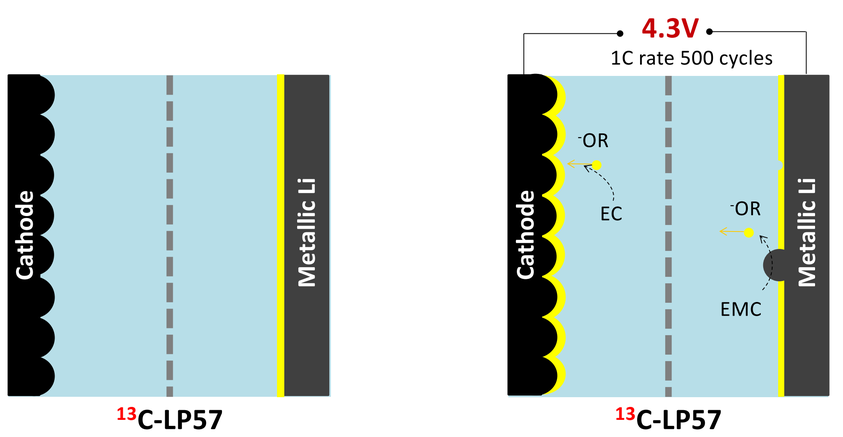
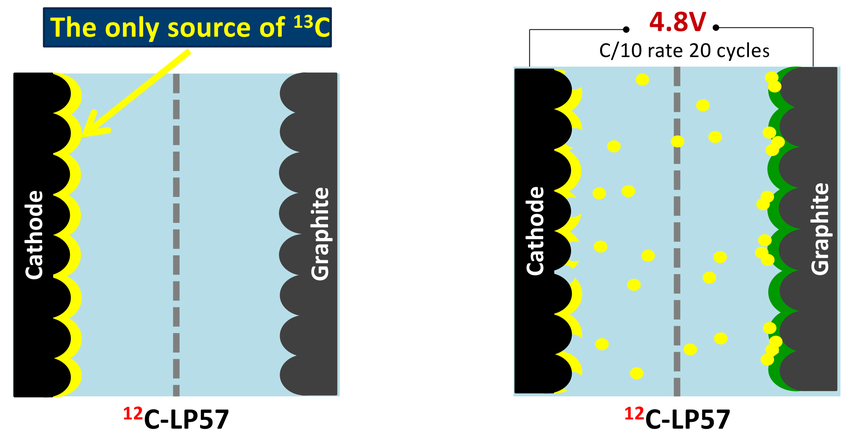
## Experiment Design

### 1. Film formation step – Cell 1

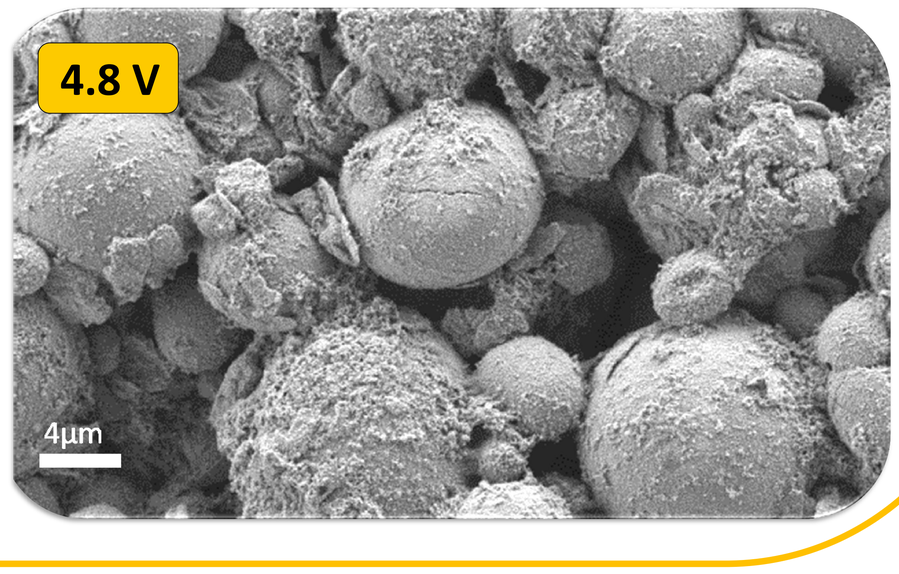



### 2. Film decomposition step – Cell 2




| 1. Film-formation step | |
|---|---|
| Anode | Lithium |
| Electrolyte | $^{13}$C-LP57 (1M LiPF6 in $^{13}$EC:EMC=3:7) |
| Potential window | From 3$^{rd}$ cycle onward = 2.5-4.3 V vs $Li^+$/Li |
| Cycling rate | 1C |
| Cycles | 500 |

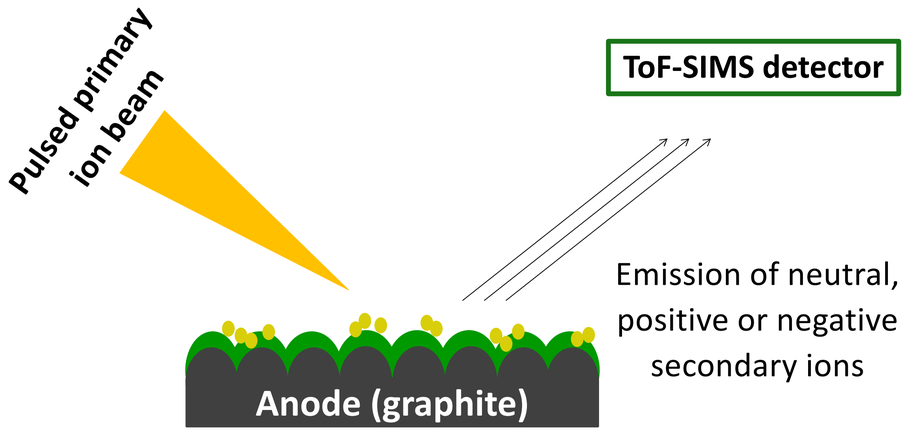
| 2. Film-transfer step | |
|---|---|
| Anode | Graphite |
| Electrolyte | $^{12}$C-LP57 (1M LiPF6 in $^{12}$EC:EMC=3:7) |
| Potential window | 1 - 4.8 V |
| Cycling rate | C/10 |
| Cycles | 20 |

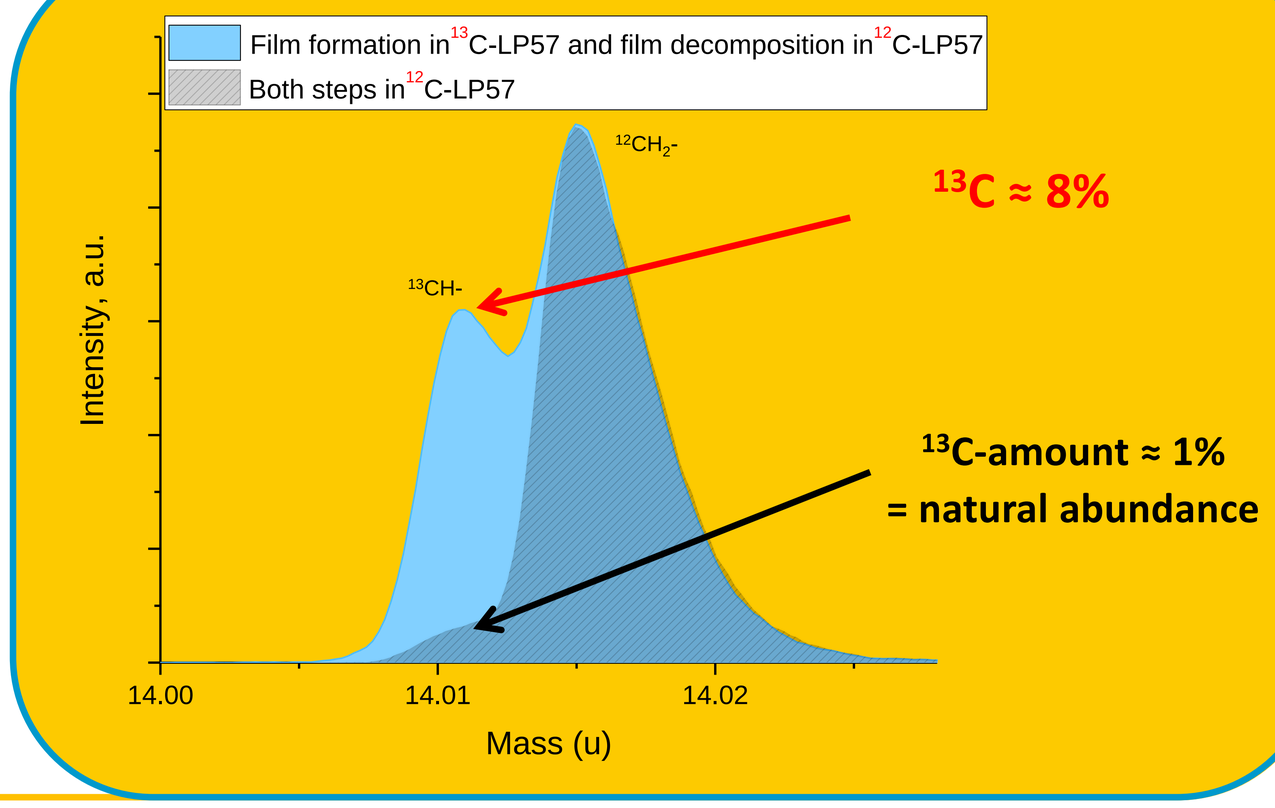




## 3. Analysis: $^{13}$C-content at the Anode Surface after Film Decomposition Step

### Time-of-Flight Secondary Ion Mass Spectrometry

### ToF-SIMS

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