

# Supporting Information

## Understanding the Effects of Electrode Formulation on the Mechanical Strength of Composite Electrodes for Flexible Batteries

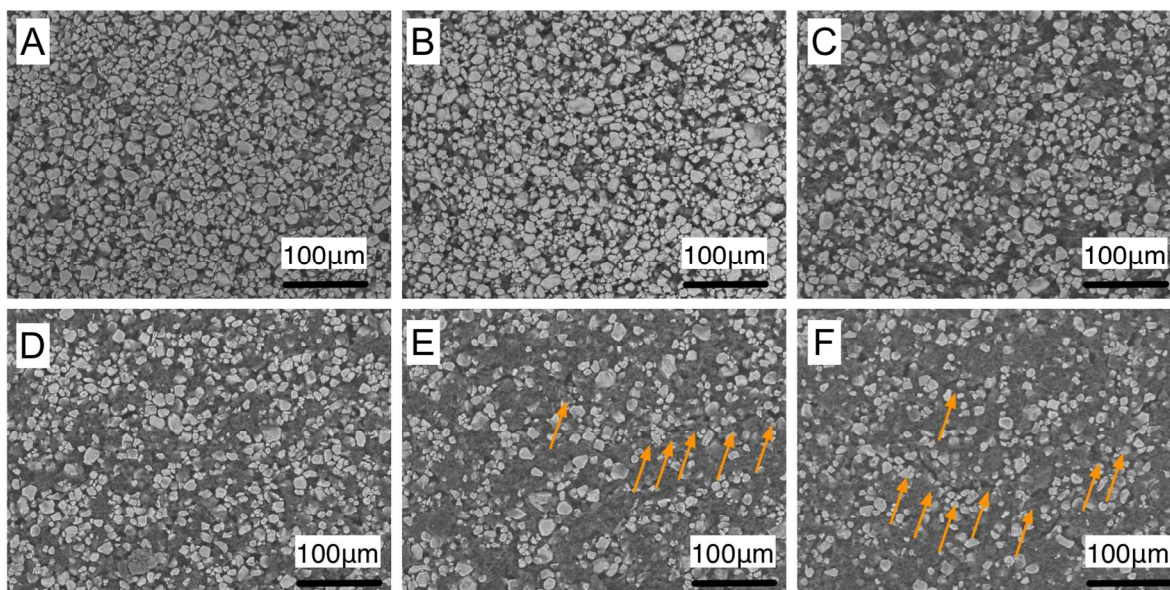
*Abhinav M. Gaikwad\*, and Ana Claudia Arias\**

Electrical Engineering and Computer Sciences Department,

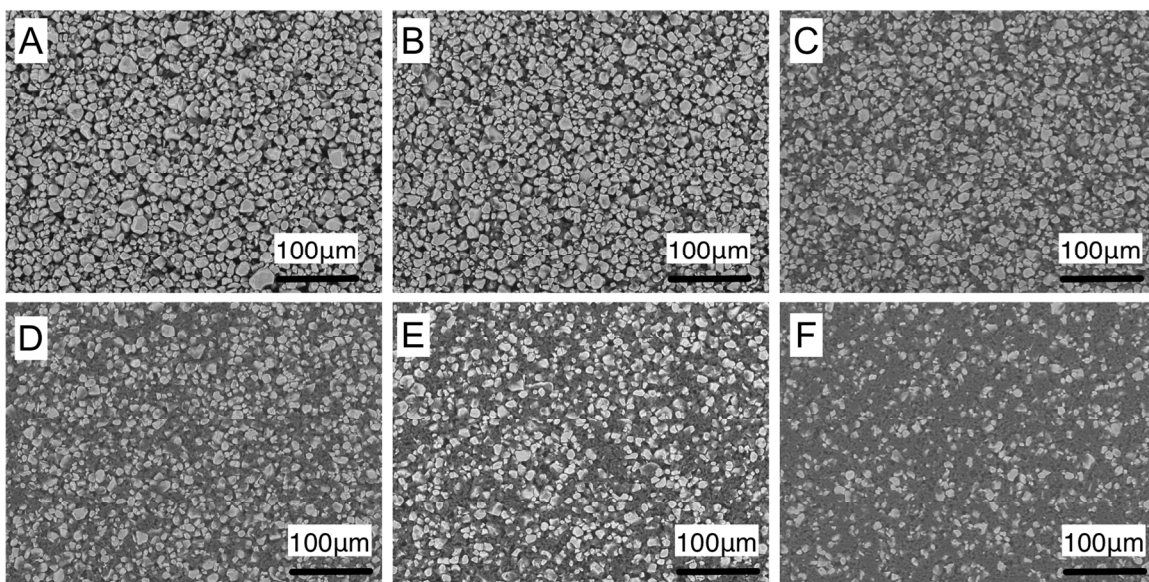
University of California Berkeley,

Berkeley, CA 94720, USA.

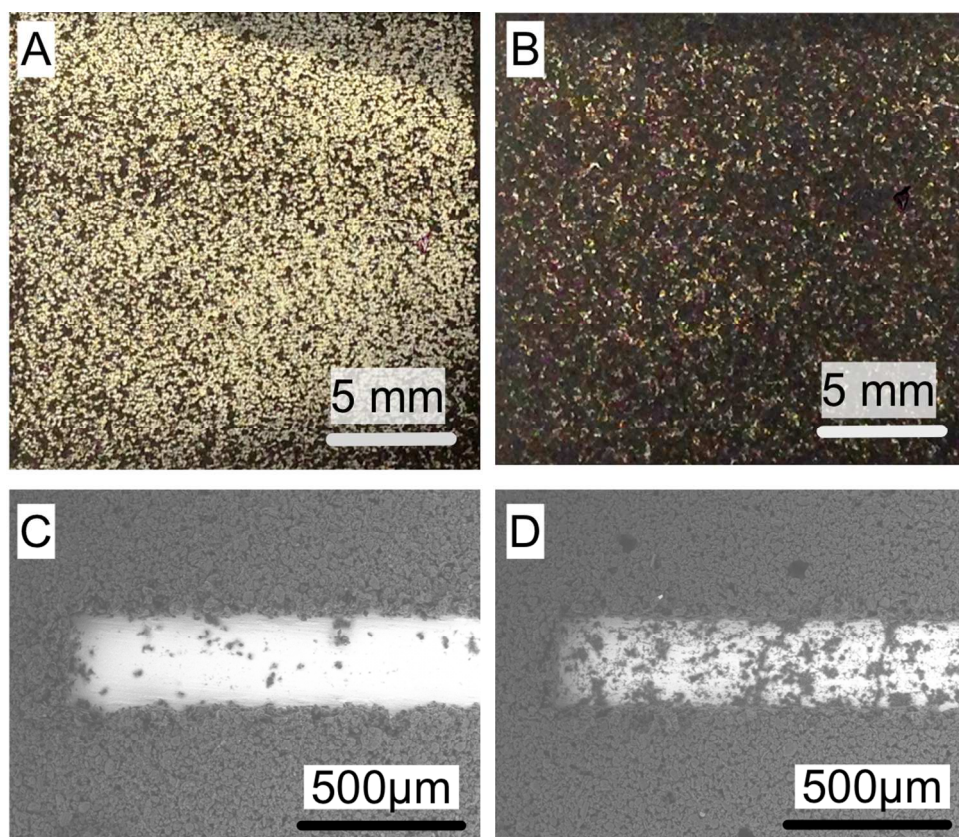
E-mail: [agaikwad@berkeley.edu](mailto:agaikwad@berkeley.edu), [acarias@eecs.berkeley.edu](mailto:acarias@eecs.berkeley.edu)



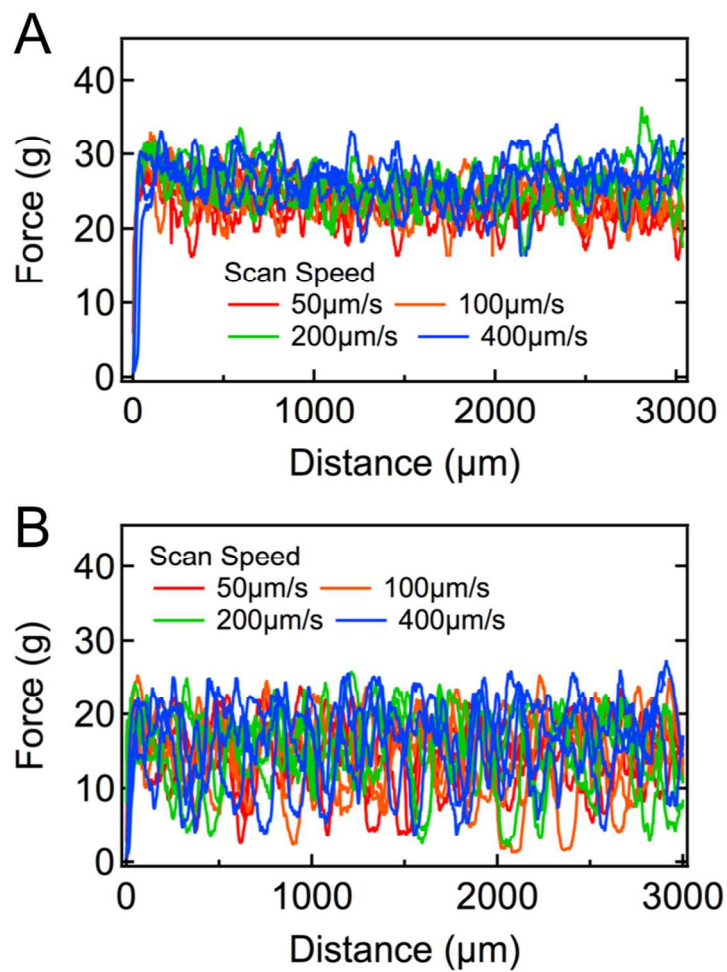
**Figure S1.** SEM micrographs of the LCO electrodes with (A) 1, (B) 2, (C) 4, (D) 6, (E) 8 and (F) 10 wt.% of carbon black (C65) as the conductive additive. The arrows show crack formations in the electrode.



**Figure S2.** SEM micrograph of the LCO electrodes with (A) 1, (B) 2, (C) 4, (D) 6, (E) 8 and (F) 10 wt.% of graphite (SFG 6L) as the conductive additive.

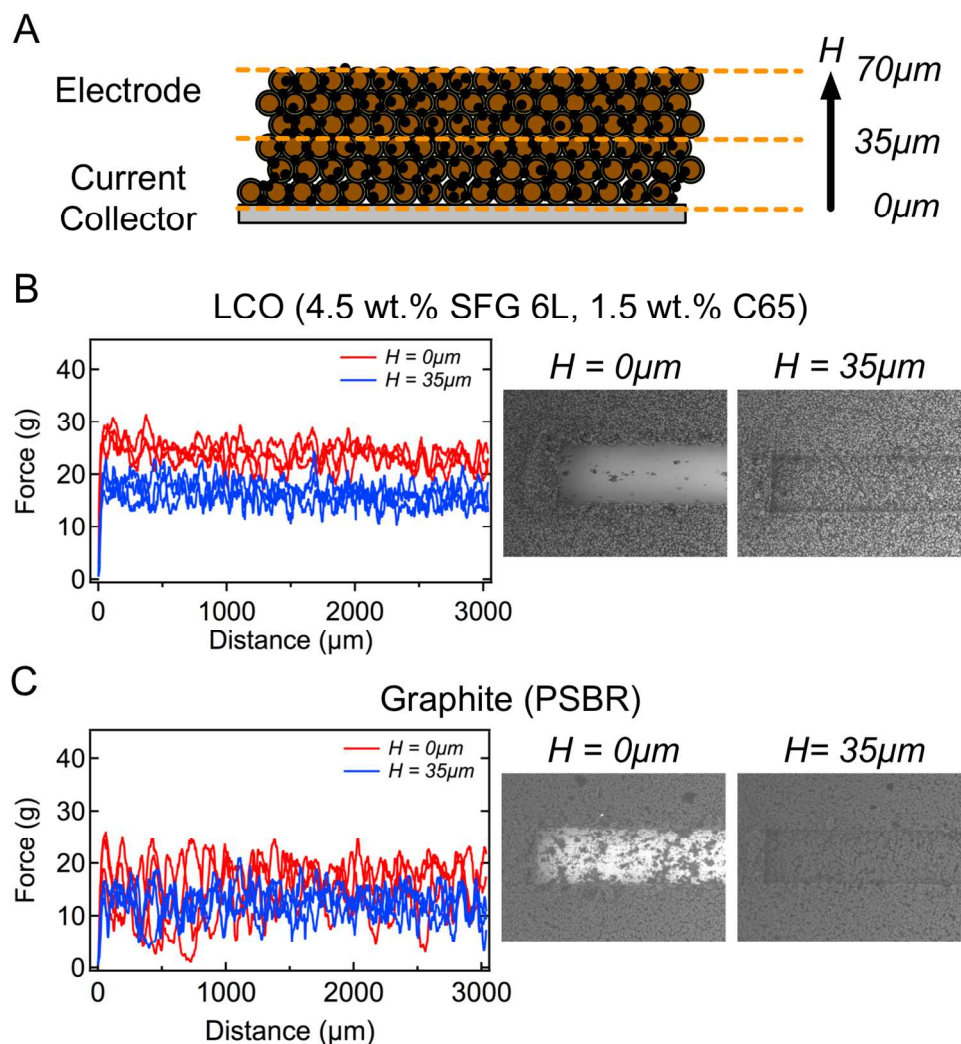


**Figure S3.** Optical micrograph of the graphite electrodes with (A) PVDF and (B) PSBR binder after the peel test. SEM micrograph of the graphite electrode with (C) PVDF and (D) PSBR binder after the drag test .

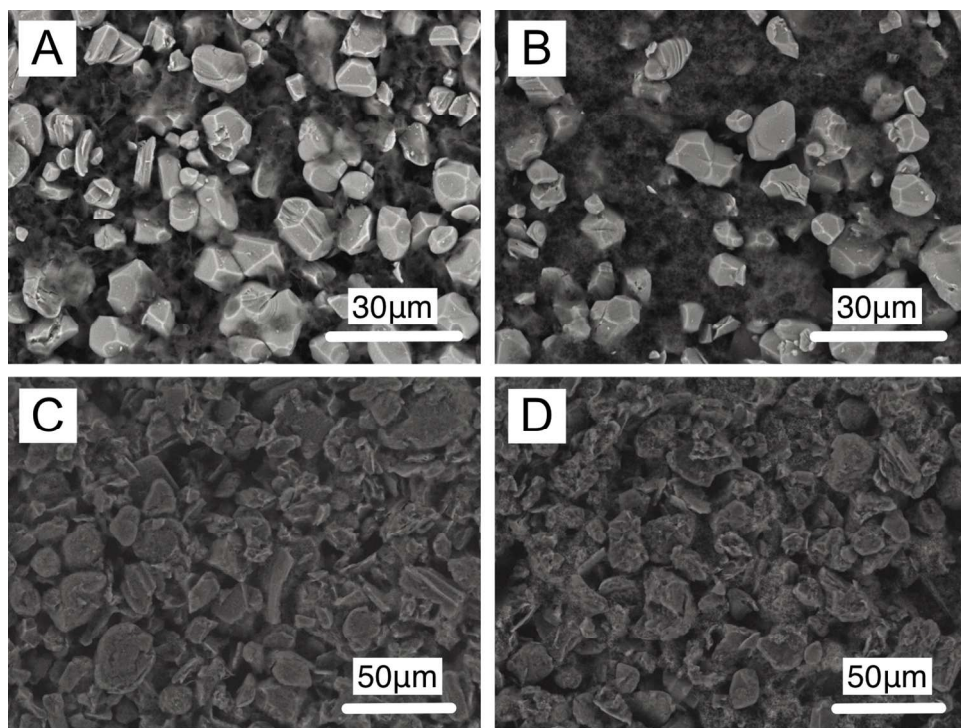


**Figure S4.** (A) Drag force on the LCO electrode (4.5 wt.% graphite and 1.5 wt.% carbon black) at the tip speed of 50, 100, 200 and 400  $\mu\text{m/s}$ . (B) Drag force on the graphite electrode (PSBR binder) at the tip speed of 50, 100, 200 and 400  $\mu\text{m/s}$ . Three scans are carried out at each tip speed.

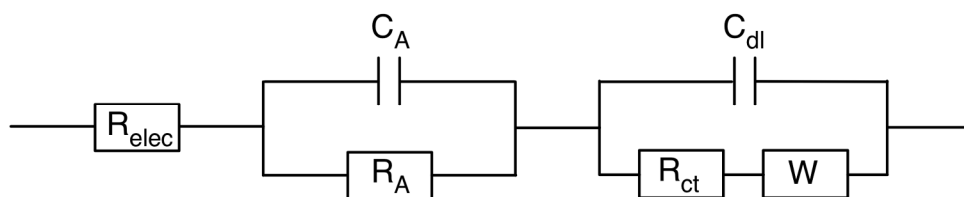




**Figure S5.** (A) Schematic of the composite electrode. The surface of the current collector is used as the reference to measure the height of the tip. (B) Drag force on the LCO electrode (4.5 wt.% graphite and 1.5 wt.% carbon black) with the tip at a height of 0 and 35  $\mu\text{m}$ . (C) Drag force on graphite electrode (PSBR) with the tip at a height of 0 and 35  $\mu\text{m}$ . The tip speed was 100  $\mu\text{m/s}$  and three scans were performed at each height.



**Figure S6.** SEM micrograph of the LCO electrodes with (A) modified and (B) standard composition, respectively. SEM micrograph of the graphite electrodes with (C) modified and (D) standard composition, respectively.



**Figure S7.** Equivalent electrical circuit to model the LCO-C batteries.