

# Lawrence Berkeley National Laboratory

LBL Publications

Title

CRADA: In situ analysis of potential distribution in Li-ion Batteries

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**CRADA No.** CRADA008852TO002

**LBNL Report Number** \_\_\_\_\_

**OSTI Number** \_\_\_\_\_

1. Parties: California Clean Energy Fund (Prime: Hitachi, Ltd.)
2. Title of the Project: In situ analysis of potential distribution in Li-ion Batteries
3. Summary of the specific research and project accomplishments:  
(Were the goals of the CRADA achieved? Include relevant information but do not include proprietary or protected CRADA information.)

Developed an in situ method of imaging and analysis of local potential distribution in model and composite Li-ion electrodes during charge/discharge process. Used a scanning probe microscope to detect and image potential differences within the electrode and the corresponding variations of the active material local state of charge.

4. Deliverables:

Deliverable Achieved	Party (LBNL, Participant, Both)	Delivered to Other Party?
Working knowledge of capability of AFM Tool – 3 months from project start	Participant	
Ability to execute hands-on preparation of sputter deposited electrodes – 6 months from project start	Participant	
Successful transposition of the use of scanning probe of SPM microscope as reference electrode to Li-ion batteries – 9 months from project start .	Participant	
Demonstrated feasibility of techniques learned during the first 9 months of the project to measure charge of electrode in order to assess/map-out SOC of electrodes – 12 months from project start.	Participant	

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5. Identify publications or presentations at conferences directly related to the CRADA?  
N/A

6. List of Subject Inventions and software developed under the CRADA:  
(Please provide identifying numbers or other information.)  
N/A

7. A final abstract suitable for public release:  
(Very brief description of the project and accomplishments without inclusion of any proprietary information or protected CRADA information.)

This project accomplished the goal of developing an in situ method of imaging and analysis of local potential distribution in model and composite Li-ion electrodes during charge/discharge process. A scanning probe microscope was used to detect and image potential differences within the composite LCO electrode and the corresponding variations of the active material local state of charge.

8. Benefits to DOE, LBNL, Participant and/or the U.S. economy.

This project supplemented our ongoing DOE-sponsored projects in rechargeable battery diagnostics and enhanced our portfolio of advanced characterization tools.

9. Financial Contributions to the CRADA:

DOE Funding to LBNL	\$0.00
Participant Funding to LBNL	\$30,000.00
Participant In-Kind Contribution Value	\$0.00
Total of all Contributions	\$30,000.00