a division of **Harvard Bioscience, Inc.**

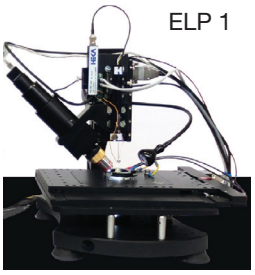
ElProScan

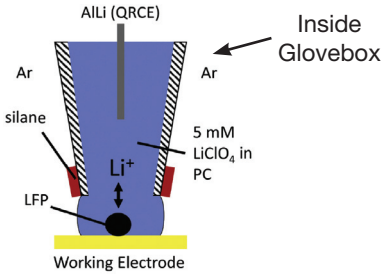
The Ultimate Electrochemical Scanning Probe Microscope System

Localized Electrochemical and Topographical Imaging of Li-ion Battery Materials

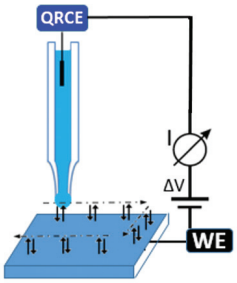
SECCM (Scanning Electrochemical Cell Microscopy) and SMCM (Scanning Micropipette Contact Method) were employed to image practical lithium iron phosphate (LFP) particles at the single particle level. Both topography height resolution and lateral XY resolution may reach nano-scale. ElProScan's tolerance in Z-axis scan range is at least 5x better than a typical AFM.

ElProScan ELP 1 positioning system may be integrated inside an argon-filled Glovebox.

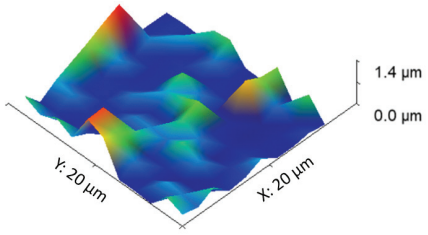




SECCM / SMCM hopping mode scan routine can be freely programmed and automated by users.

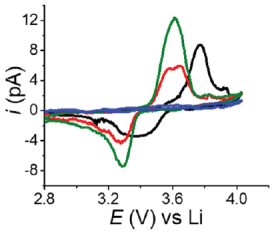


SECCM Constant Distance Matrix Scan

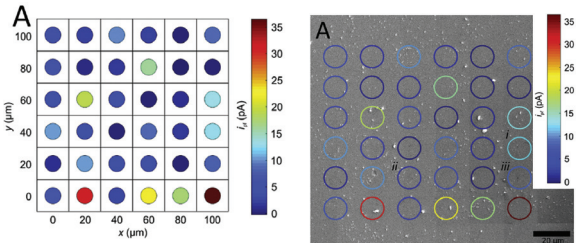


In situ topography map of electrode surface

Topography and redox activity of individual LFP nanoparticles or nanoclusters can be imaged simultaneously.



Selected representative micro-CV of individual particles recorded in SECCM Matrix Scan.



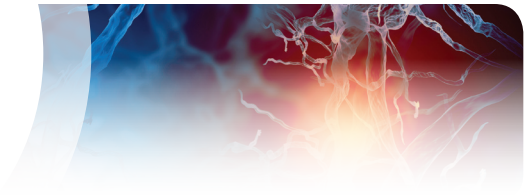
Local maps of oxidation peak current from each micro-CV overlaid with SEM micrographs of the scanned electrode surface.

Snowden et al. Journal of Power Sources, 325 (2016) 682–689

HEKA Elektronik Dr. Schulze GmbH
sales@heka.com
www.heka.com

SE Smart Ephys
a **Harvard Bioscience, Inc.** brand

HEKA
a division of Harvard Bioscience, Inc.

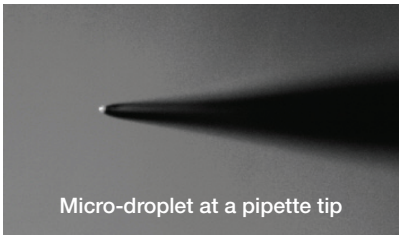


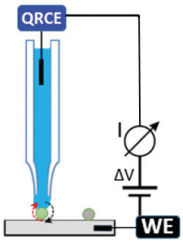
ElProScan

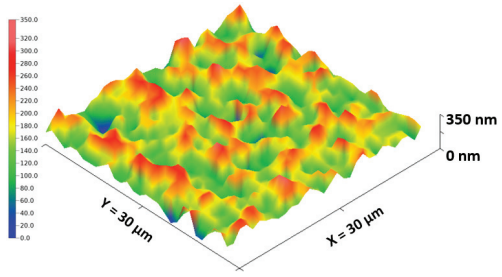
The Ultimate Electrochemical Scanning Probe Microscope System

SECCM and SMCM for Imaging Conducting Polymers

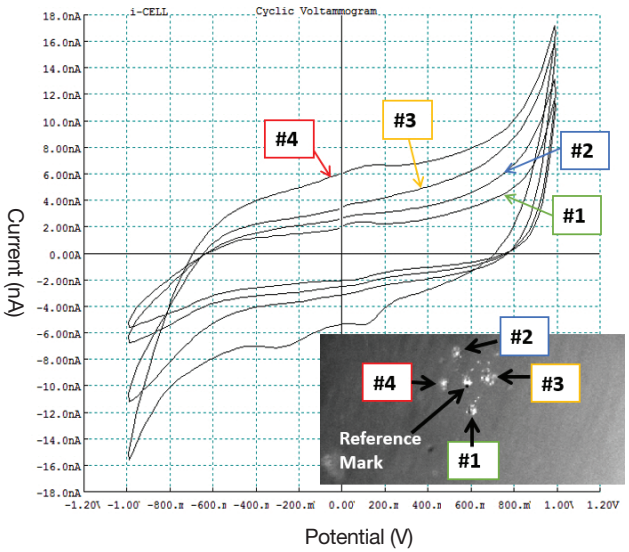
Topography imaging and micro-CV of conductive polymers via user-pulled micropipette tip







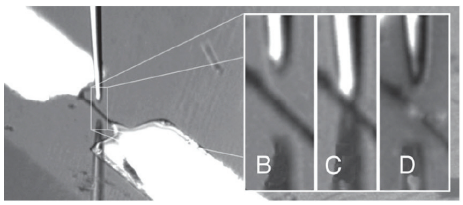
Topography image of conducting polymers scanned in SMCM Droplet Cell mode



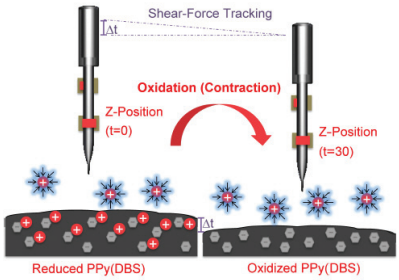
Comparison of the 5th cycle of µ-CV plots among different local spots, indicating different doping environments of conductive polymers.

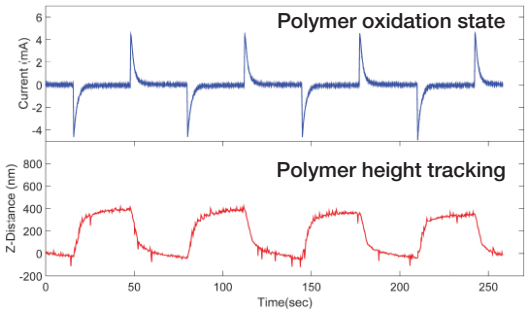
Micro-fabrication of PEDOT nanowire (~600nm dia.), electro-polymerized between two gold pads.

Laslau et al. Adv. Funct. Mater. ***2011****, 21, 4607–4616*



Simultaneous surface height tracking and activity mapping by Shear-force Sensing Technique





[1] Phys. Chem. Chem. Phys., **(2016)***, 18, 17366-17372;*
[2] Phys. Chem. Chem. Phys., **(2015)***, 17, 32268-32275.*

Electrochemically induced height changes of polymer membrane can be imaged and tracked instantly by a UME probe with Shear-force Sensing technique.

HEKA Elektronik Dr. Schulze GmbH
sales@heka.com
www.heka.com

SE Smart Ephys
a Harvard Bioscience, Inc. brand