Metal Negative Electrode for Next-Generation Batteries

Keywords: rechargeable battery, metal negative electrode, single particle measurement

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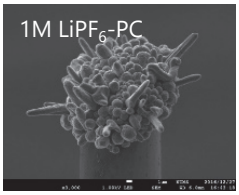
Background

- Power supply of electric vehicles and sustainable energy system
- New electrode materials with high capacity and long cycle life
- Next-generation batteries system

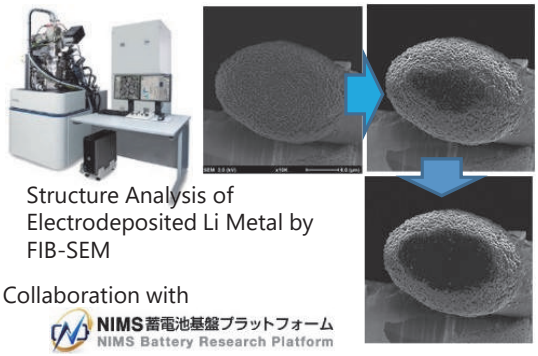
Aim

- Research for next-generation batteries with high energy density
- New negative electrode materials with high capacity
- Intrinsic electrochemical characteristic of battery electrode materials

Advanced Research Topics



Concentration Effect on Electrodeposited Li onto an Ultra-Micro-Electrode
(Electrodeposition Condition : 2 mA/cm^2, 1hour)

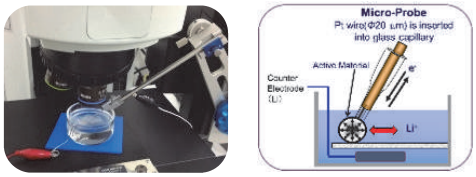


Structure Analysis of Electrodeposited Li Metal by FIB-SEM

Collaboration with
NIMS蓄電池基盤プラットフォーム
NIMS Battery Research Platform

Machines for Li Metal Foil Tailoring

(L : Vacuum Furnace, C : Extruder, R : Rolling Mill)



Single Particle Measurement for Evaluation of Electrode Material Particle
(L : Single Particle Measurement Set-up,
R : Schematic Diagram of Electrochemical Cell)

Publications

・Kei Nishikawa, et al., J. Electroanal. Chem., **799** (2017) 468-472.
・Kei Nishikawa, et al., J. Power sources. **302** (2016) 46-52.
・N. Zettsu, J. Mater. Chem. A. **3** (2015) 17015-17021.

Summary

- Electrodeposition and electrochemical dissolution of Li metal onto an ultra-micro-electrode
- Li metal foil tailoring in Ar-filled glove box
- Single particle measurement for intrinsic electrochemical characteristics

Research outcome

- Morphology control of Li metal electrode during charging and discharging
- Surface treatment of Li metal surface
- Rechargeable battery electrode design