

Friday Morning, November 10, 2023

Advanced Focused Ion Beams Focus Topic

Room B110-112 - Session IB1-FrM

Advances in FIB Specimen Preparation

Moderators: **Tanvi Ajantiwalay**, Pacific Northwest National Laboratory,
Gregor Hlawacek, Helmholtz-Zentrum Dresden - Rossendorf

8:20am **IB1-FrM-1 An Air-Free Transfer Mechanism For FIB SEM**, **Valerie Brogden**, *J. Garman, S. Wiemholt, K. Langworthy*, University of Oregon

INVITED

Lithium-ion batteries are increasingly prolific in the landscape of modern technology. Analysis of lithium metals with techniques such as Scanning Electron Microscopy (SEM) and Focused Ion Beam (FIB) can reveal critical information about the microstructure and composition of these materials. However, a problem presents itself when loading lithium metals into SEM/FIB systems. Lithium and other battery materials react with oxygen and can be quickly contaminated by exposure to atmosphere. Therefore, samples must be manipulated in an oxygen-free glove box. There is not currently a solution for mounting lithium samples onto a SEM/FIB stage for analysis without exposing the samples to atmosphere.

In this paper, we present a prototype for a glove box load lock that addresses this problem directly. This device bolts directly onto a ThermoFisher Plasma FIB and allows researchers to remove samples from positive-pressure packaging and mount the samples directly on the stage in an oxygen-free environment, and then pump the tool down to vacuum without contamination by atmosphere.

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