Introduction of EPIC/NUANCE in-situ TEM instruments for Battery Research

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As supported by Northwestern University Core Facility Fund and Materials Research Science and Engineering Center (MRSEC) Equipment Fund, EPIC has acquired several key instruments for in-situ TEM on battery research, such as VAC glove box, Nanofactory EP1000 in-situ electric probing system, and Protochips Poseidon 500 liquid-flow and electric biasing holder. With these in-situ holders, dedicated and high resolution electron microscopes (i.e. JEOL-2100F TEM, Hitachi HD-2300 STEM and Hitachi HT-7700 S/TEM) have been applied to investigate the microstructural evolutions of miniature batteries. Some examples of observing the dynamic lithiation and delithiation process at high spatial resolution in nanostructured electrode materials (such as oxides and Si) will be demonstrated in the talk.