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Evolution of Evaporative Coatings of Lithium from LTX-β with Temperature and Their Analysis with XPS and LEIS[1] A.C. HERSCHBERG, University of Illinois, Urbana-Champaign , E.T. OSTROWSKI, Chemical and Biological Engineering, Princeton University, A. MAAN, University of Tennessee, Knoxville, B.E. KOEL, Chemical and Biological Engineering, Princeton University — Plasma-material interactions (PMI) strongly influence lifetimes of plasma facing components (PFCs) and plasma performance. The choice of low-Z PFCs such as lithium (Li) offer attractive features such as lower radiative power loss and the possibility to operate in a flat temperature profile regime, as demonstrated by evaporative coatings on LTX-β. We present X-ray photoelectron spectroscopy (XPS) and low energy ion scattering spectroscopy (LEIS) analysis of witness samples using the Sample Exposure Probe (SEP), a portable ultrahigh vacuum (UHV) chamber, which introduces samples to LTX-β. These witness samples can then be transported to a surface analysis station. Li coatings on witness samples are then analyzed using XPS and LEIS to make observations on the effects of the LTX-β environment on the first wall. The combined XPS and LEIS illustrate the oxidation of the Li coatings, forming Li_2O and LiOH on top of evaporatively coated Li. The evolution of these oxides has a strong temperature dependence. We present XPS and LEIS analysis of these witness samples and how they evolve with temperature.

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Andrew Herschberg
University of Illinois, Urbana-Champaign

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