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The Effects of Contamination by Residual Gases in NSTX on Deuterium Uptake and Retention in Li Films[1] ANGELA CAPECE, Princeton Plasma Physics Laboratory, OLUSEYI FASORANTI, RYAN SULLENBERGER, Princeton University, RYAN NORVAL, University of Wisconsin, BRUCE KOEL, Princeton University, CHARLES SKINNER, ROBERT KAITA, Princeton Plasma Physics Laboratory — Lithium-conditioned plasma-facing components (PFCs) have improved plasma performance by reducing the recycling of hydrogenic species; however, a quantitative understanding of the adsorption and retention of deuterium by lithium-conditioned materials is needed to optimize the performance of Li-PFCs, especially for long duration discharges anticipated in NSTX-U. We report on results from UHV surface science experiments using X-ray photoelectron spectroscopy, Auger electron spectroscopy, and thermal desorption spectroscopy. Oxygen uptake curves of solid lithium and lithium films on TZM before and after contamination by residual O_2, H_2O, CO, and air will be presented. Further work is planned for single crystal Mo(100) substrates that will distinguish the effects of impurities and grain boundaries in TZM. An ECR plasma source will be used to irradiate these substrates with deuterium neutrals and ions, and data for deuterium uptake on lithium-coated TZM and Mo(100) with exposure to the residual gases will be presented.

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