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**Temperature Dependence of Lithium Reactions with Air**[1] ROMAN SHERROD, Univ of Tennessee, Knoxville, C.H. SKINNER, PPPL, BRUCE KOEL, Princeton University — Liquid lithium plasma facing components (PFCs) are being developed to handle long pulse, high heat loads in tokamaks. Wetting by lithium of its container is essential for this application, but can be hindered by lithium oxidation by residual gases or during tokamak maintenance. Lithium PFCs will experience elevated temperatures due to plasma heat flux. This work presents measurements of lithium reactions at elevated temperatures (298-373 K) when exposed to natural air. Cylindrical TZM wells 300 microns deep with 1 cm2 surface area were filled with metallic lithium in a glovebox containing argon with less than 1.6 ppm H20, O2, and N2. The wells were transferred to a hot plate in air, and then removed periodically for mass gain measurements. Changes in the surface topography were recorded with a microscope. The mass gain of the samples at elevated temperatures followed a markedly different behavior to that at room temperature. One sample at 373 K began turning red indicative of lithium nitride, while a second turned white indicative of lithium carbonate formation. Data on the mass gain vs. temperature and associated topographic changes of the surface will be presented.

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