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Wetting Properties of Liquid Lithium on Stainless Steel and Enhanced Stainless Steel Surfaces P. FIFLIS, W. XU, P. RAMAN, D. ANDRUCZYK, D.N. RUZIC, D. CURRELI, University of Illinois at Urbana Champaign — Research into lithium as a first wall material has proven its ability to effectively getter impurities and reduce recycling of hydrogen ions at the wall. Current schemes for introducing lithium into a fusion device consist of lithium evaporators, however, as these devices evolve from pulsed to steady state, new methods will need to be employed such as the LIMIT concept of UIUC, or thin flowing film lithium walls. Critical to their implementation is understanding the interactions of liquid lithium with various surfaces. One such interaction is the wetting of materials by lithium, which may be characterized by the contact angle between the lithium and the surface. Experiments have been performed at UIUC into the contact angle of liquid lithium with a given surface, as well as methods to increase it. To reduce the oxidation rate of the droplets, the experiments were performed in vacuum, using a lithium injector to deposit drops on each surface. Among the materials investigated are stainless steel, both untreated and coated with a diamond like carbon (DLC) layer, molybdenum, and boronized molybdenum. The contact angle and its dependence on temperature is measured.

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