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Compositional changes of lithium coatings on TZM molybdenum during plasma bombardment[1] T. ABRAMS, M.A. JAWORSKI, R. KAITA, PPPL, G. DE TEMMERMAN, M.A. GLEESON, A.R. LOF, J. SCHOLTEN, M.A. VAN DEN BERG, H.J. VAN DER MEIDEN, FOM-DIFFER, P. RAMAN, D.N. RUZIC, UIUC — The Titanium-Zirconium-Molybdenum alloy TZM has previously been used as a metallic plasma-facing component in Alcator C-Mod is being considered for use in NSTX-Upgrade. The time evolution of lithium (Li) coatings on TZM are studied in Magnum-PSI, a linear plasma device capable of ion fluxes up to 10^{25} $m^{-2}s^{-1}$ at electron temperatures < 5 eV. A series of 5 s exposures were run on a bare TZM sample then repeated after an evaporation of 100 nm of Li. The temporal and spatial variation of neutral Li and oxygen (O) radiation were monitored using optical emission spectroscopy (OES) and a fast camera with a Li-I (671 nm) filter. The O-I (777 nm) line intensity decreased during discharges while the Li-I line intensity increased. The ionization mean free path (MFP) of Li was calculated and validations against the ADAS collisional-radiative model (CRM) will be reported. Separate measurements with a 100-1000 eV D^+ ion beam incident on Li-coated TZM were also obtained and compared with theoretical predictions of physical sputtering rates.

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