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Ultraviolet photoelectron spectroscopy analysis of lithium and deuterium interactions with graphite[1] C.N. TAYLOR, B. HEIM, S. ORTOLEVA, J.P. ALLAIN, Purdue University, C.H. SKINNER, PPPPL, H.W. KUGEL, A.L. ROQUEMORE, R. KAITA, PPPL, PURDUE UNIVERSITY TEAM, PRINCETON PLASMA PHYSICS LABORATORY COLLABORATION
— Lithium wall conditioning has been implemented in fusion devices such as TFTR, CDX-U, FTU, T-11M, TJ-II and NSTX and has yielded improved plasma performance. Offline experiments at Purdue University have investigated the mechanism by which Li interacts with D. X-ray photoelectron spectroscopy (XPS) analysis has shown that deuterium irradiation induces interactions with Li-C and Li-O bonds. Ultraviolet photoelectron spectroscopy (UPS) shows Li_2O 2p orbital emission energy of 6.5 eV [1]. UPS probes the outermost valence electron orbital (probe depth $\sim$1nm), and yields information more sensitive to chemical bonding than XPS (probe depth $\sim$10nm). This work examines D interaction with lithiated graphite. Additionally, high-resolution electron energy loss spectroscopy (HR-EELS) provides complementary information regarding H bond hybridization.

[1] D. Ensling et al. Applied Surface Science 255 (2008) 2517–2523.

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