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Studies of lithiumization and boronization of ATJ graphite PFCs for NSTX-U[1] JAVIER DOMINGUEZ, State Univ of NY- Stony Brook, FELIPE BEDOYA, University of Illinois Urbana, PREDRAG KRSTIC, State Univ of NY- Stony Brook, JEAN PAUL ALLAIN, ANTON NEFF, University of Illinois Urbana, KARA LUITJOHAN, Purdue University — We examine and compare the effects of boron and lithium conditioning on ATJ graphite surfaces bombarded by low-energy deuterium atoms on deuterium retention and chemical sputtering. We use atomistic simulations and compare them with experimental in-situ ex-tempore studies with X-ray photoelectron spectroscopy (XPS), to understand the effects of deuterium exposure on the chemistry in lithiated, boronized and oxidized amorphous carbon surfaces. Our results are validated qualitatively by comparison with experiments and with classical-quantum molecular dynamic simulations. We explain the important role of oxygen in D retention for lithiated surfaces and the suppression of the oxygen role by boron in boronized surfaces. The calculated increase of the oxygen role in deuterium uptake after D accumulation in a B-C-O surface configuration is discussed. The sputtering yield per low-energy D impact is significantly smaller in boronized surfaces than in lithiated surfaces.

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