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Chemical Sputtering Studies of Lithiated Graphite[1] PRIYA RAMAN, ANDREW GROLL, University of Illinois, TYLER ABRAMS, PPPL, DAVIDE CURRELI, DANIEL ANDRUCZYK, D.N. RUZIC, University of Illinois —
Lithium treatments in the National Spherical Torus Experiment have shown dramatic improvements in plasma performance. In order to understand the complex system of lithiated ATJ graphite, chemical sputtering measurements of plain and lithiated ATJ graphite are conducted in IIAX (Ion Surface Interaction Experiment) facility with a differentially pumped Magnetic Sector Residual Gas Analyzer (MSRGA). The ATJ graphite target is mounted in such way that the target can be translated along a line to different positions to get direct comparison of ATJ and lithiated ATJ. Target is heated using joule heating and is connected to a biasing circuitry. Chemical sputtering of graphite is dependent on the ion energy and substrate temperature, hence the total effects of treating ATJ graphite with lithium in hydrogen plasma is investigated in terms of different target temperatures and bias voltages. For this purpose, lithium is evaporated in-situ onto ATJ graphite and chemically sputtered species in hydrogen plasma is measured using MSRGA. The dominant chemical sputtering product is CH4. It was found that lithium treatments have suppressed the chemical sputtering of ATJ Graphite. The suppression of chemical sputtering effect is presented as a function of varying lithium thickness on ATJ Graphite.

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