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Chemical Sputtering of graphite surfaces by slow H and D Atomic and Molecular projectiles[1] F.W. MEYER, H. ZHANG, H.F. KRAUSE, Physics Division, Oak Ridge National Laboratory — Because of its high thermal conductivity, excellent shock resistance, absence of melting, low activation, and low atomic number, there is significant technological interest in using graphite as a plasma-facing component on present and future fusion devices, despite its poor chemical erosion and sputtering properties. As divertor designs evolve, the interest in the erosion characteristics of the carbon surfaces is shifting to progressively lower impact energies. Results are presented of chemical sputtering yields for ATJ graphite and HOPG impacted by $H^+(D^+)$, $H_2^+(D_2^+)$and $H_3^+(D_3^+)$ in the energy range 5-250 eV/amu. The measurements serve as benchmarks for in house MD simulations [Physica Scripta **T128**, 50 (2007)] of the chemical sputtering process that seek to incorporate more realistic many-body potentials and to expand the reaction pathway to include vibrational and/or electronic excited states. Comparison between same velocity atomic and molecular ion impact at energies as low as 5 eV/amu will be described [J. Nucl. Mater. **357**, 9(2006)]. In addition, the isotope effect in methane production by H and D incident ions will be discussed.

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