

Abstract Submitted
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Isotope effect on charge transfer in collisions of H with He⁺ and He²⁺ JEROME LOREAU, Harvard-Smithsonian Center for Astrophysics, SERGEY RYABCHENKO, Pomor State University, NATHALIE VAECK, Université Libre de Bruxelles — In magnetically confined plasmas, the presence of impurities can be used as a diagnostic tool through the observation of their emission lines. In the edge region, where particle energies are lower than 100 eV, charge transfer with the hydrogen from the plasma can significantly modify the abundance of the impurities. In this work, we study the charge transfer process in collisions of H with He⁺ or He²⁺ ions at energies between 0.1 and 200 eV/amu. To calculate the cross section for these reactions, we use a quantal method which consists in a combination of ab initio and wave packet propagation methods, and compare our results with the use of the semi-classical eikonal method. We consider in particular the isotope effect that arises when hydrogen is replaced by deuterium or tritium. Indeed, it was demonstrated using semi-classical methods that the isotope effect could be significant at energies as high as 200 eV/amu.

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