

Abstract Submitted  
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**Slow Collisions of Si<sup>3+</sup> with Atomic Hydrogen**<sup>1</sup> D.C. JOSEPH, J.-P. GU, B.C. SAHA, Department of Physics, Florida A&M University, Tallahassee, FL-32307, H.P. LIEBERMANN, P. FUNKE, R.J. BUENKER, Bergische Universität, Wuppertal D-42096 Wuppertal, Germany — Low energy electron capture from hydrogen atom by multi-charged ions continues to be of interest and applications include both magnetically confined fusion and astrophysical plasmas. The charge exchange process reported here,  $Si^{3+} + H \rightarrow Si^{2+} + H^+$  is an important destruction mechanism of Si<sup>3+</sup> in photo-ionized gas. The soft X-ray emission from comets has been explained by charge transfer of solar wind ions, among them Si<sup>3+</sup>, with neutrals in the cometary gas vapor. The state selective cross sections are evaluated using the full quantum [1] and semi-classical molecular orbital close coupling (MOCC) [2] methods. Adiabatic potentials and wave functions for a number of low-lying singlet and triplet states of and symmetry are calculated using the MRD-CI package [3]. Details will be presented at the conference.

[1] L. B. Zhao, D. C. Joseph, B. C. Saha, H. P. Liebermann, P. Funke and R. J. Buenker, Phys. Rev A, **79**, 034701 (1009).

[2] M. Kimura and N. F. Lane, At. Mol. Opt. Phys **26**, 79 (1990).

[3] R. J. Buenker, "Current Aspects of Quantum Chemistry 1981, Vol **21**, edited by R. Carbo (Elsevier, Amsterdam) p 17.

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