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Slow B^{5+}+ H_2 Collisions BIDHAN SAHA, DWAYNE JOSEPH, Department of Physics, Florida A&M University — The charge-exchange processes involving ions and atomic targets have received considerable theoretical and experimental considerable attentions over the last decades owing to its immense applications in both astrophysical and magnetically confined thermonuclear fusion plasmas. However, for molecular targets there are not many accurate calculations although the charge-exchange processes provide valuable inputs on the radiation research, multi-charged ion source developments, and lasers radiating in the visible ultraviolet (VUV) and X-ray regions. The electron capture cross sections in such an environment are appreciably larger. The recently observed X-ray emission data from the comets suggest that the charge exchange between solar wind and cometary gases is the most likely mechanism for X-ray production. We report our MO calculation for the process B^{5+}+ H_2 $\diamondsuit$ B^{4+}(nl) + H_2^+ at low energies. We use a semi-classical, impact parameter, close coupling approach based on the molecular-state expansion augmented with the plane-wave electron translation factor, freezing the molecular details of the target [1], the effective binding of the active electron inside the transient molecule is simulated employing the pseudo-potential techniques [2]. Details will be presented at the conference. [1] B. C. Saha and A. Kumar, Theo. Chem 487, 11 (1999). [2] A. Kumar and B. C. Saha, Phys. Rev. A.59, 1273 (1999).

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