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Resonant Enhancement of Ground State H_2^+ Formation in Low Energy Charge Transfer between Protons and H_2[1] V.M. ANDRIANARIJAONA, J.G. KING, M.F. MARTIN, Department of Physics, Pacific Union College, Angwin, CA 94508, N. DE RUETTE, Department of Astronomy, Columbia University, NYC, NY 10027, X. URBAIN, Université Catholique de Louvain, Institute of Condensed Matter and Nanosciences, Chemin du Cyclotron 2, B-1348 Louvain-la-Neuve, Belgium — We investigated the charge transfer (CT) from an H_2 or D_2 target to various fast atomic/molecular ions for a wide span of collision energies in the laboratory frame (eV to keV). Vibrationally resolved cross sections have been obtained on a relative scale, by dissociative charge transfer of the product H_2^+ ions with potassium atoms, and 3-D imaging of the fragments. An absolute value of the total CT cross section has been inferred from the measured ratio of the CT yield for protons and H_2^+, combined with the recommended H_2^++H_2 cross section (ORNL). Our results on the (H_2, H^+) system benchmark state-to-state calculations at 10eV and above (Phys. Rev. A **75** 032703, 2007 and J. Phys. B **42**, 105207 2009). In particular, they confirm the vibrational excitation mechanism responsible for the resonance at 50eV, characterized by a dominant population of the ground vibrational state of H_2^+. The spectra for the isotopic system (D_2, H^+) will be also presented along with the results of CT performed with H_2^+ and D_2^+ projectiles.

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