VI Conference on Active Galactic Nuclei
and Gravitational Lensing
June 02-06, 2024, Zlatibor Mt., Serbia
https://doi.org/10.69646/aob24014

REACTIVE COLLISIONS BETWEEN ELECTONS AND MOLECULAR IONS-ESSENTIAL ELEMENTARY PROCESSES IN THE INTERSTELLAR MEDIA

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We describe the major low-energy electron-impact processes involving H_2^+ and HD^+, relevant for the early universe astrochemistry: dissociative recombination, inelastic and superelastic scattering. The Multichannel Quantum Defect Theory (MQDT) has been employed in computing cross sections and Maxwell rate coefficients for electron-driven reactions involving molecular cations. A new series of computations has been performed to obtain cross sections and rate coefficients

for state-to-state ro-vibrational transitions on the H_2^+ and HD^+ ion, induced in collisions with low-energy electrons. We report cross sections and Maxwellian rate coefficients for both rotational and vibrational transitions, from the lowest 30 ro-vibrational levels and outline several important features, like rotational and resonant effects.