

State-selective charge-transfer and ionisation in collisions of various Ar ions with hydrogen

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We have developed a method that can produce an effective potential to model interactions of an arbitrary multi-electron impurity ion with hydrogen. As an example, we apply the two-centre wave-packet convergent close-coupling (WP-CCC) approach to collisions involving various Ar ions. The approach has been applied to calculate the total ionisation and state-resolved electron-transfer and target-excitation cross sections in Ar^{3+} , Ar^{16+} , Ar^{17+} and Ar^{18+} collisions with atomic hydrogen. The cross sections are calculated in a broad projectile energy range from 2 keV/u to 1 MeV/u. The results are compared with the CTMC and AOCC ones. For charge exchange in collisions of Ar^{3+} ions with hydrogen in the ground state, capture into states with $n=3$, where n is the final-state principal quantum number, are found to be dominant in the entire range energy range considered.