SINGLE ELECTRON CAPTURE IN FAST ION-ATOM COLLISIONS

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Single-electron capture cross sections in collisions between fast bare projectiles and heliumlike atomic systems is investigated by means of the four-body boundary-corrected first Born (CB1-4B) approximation. The prior and post transition amplitudes for single charge exchange encompassing symmetric and asymmetric collisions are derived in terms of twodimensional real integrals in the case of the prior form and five-dimensional quadratures for the post form. The dielectronic interaction $V_{12} = 1/r_{12} = 1/[r_1-r_2]$ explicitly appears in the complete perturbation potential V_f of the post transition probability amplitude T_{if}^{+}. An illustrative computation is performed involving state-selective and total single capture cross sections for the p - He (prior and post form) and He^{2+}; Li^{3+}; Be^{4+};B^{5+};C^{6+} -He (prior form) collisions at intermediate and high impact energies. We have also studied differential cross sections in prior and post form for single electron transfer from helium by protons. The role of dynamic correlations is examined as a function of increased projectile energy. Detailed comparisons with the measurements are carried out and the obtained theoretical cross sections are in reasonable agreement with the available experimental data.