

Abstract Submitted
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Electron Transfer, Excitation, and Ionization in Collisions between α Particles and H(1s) Atoms THOMAS WINTER, Pennsylvania State University — Cross sections have been determined for electron transfer and excitation to each individual state up to 3d, to all states, and for ionization in 3-2400 keV α -H collisions using a double-center, 80-281-state Sturmian basis, substantially expanding the Sturmian calculations carried out a quarter of a century ago, which were limited to 19-24 states and reported only electron transfer to all states, and only for a much more limited energy range.¹ At the lower and intermediate energies, cross sections have now been obtained with a basis of approximately the same number of Sturmians on each nuclear center, while at α energies of at least 800 keV results they have also been obtained with a predominantly target-centered basis. The results for capture are better converged at the lower energies, while those for excitation and ionization, at the higher energies, where they may also be compared to Born results. Except at low energies, results may be compared with the atomic-plus-pseudostate results of Kuang and Lin,² while at all energies, the results for total capture and ionization may be compared with the coupled-Gaussian results of Toshima.³

¹T. G. Winter, Phys. Rev. A **25**, 697 (1982).

²J. Kuang and C. D. Lin, J. Phys. B **30**, 101 (1997)

³N. Toshima, Phys. Rev. A **50**, 3940 (1994).

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