

Abstract Submitted
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Signature of s-wave scattering in atom-ion resonant charge transfer¹ ROBIN COTE, University of Connecticut — Collisions between an ion and its parent neutral atom can lead resonant charge transfer. This is an example of resonant exchange, a general process playing a key role in many-body dynamics and transport phenomena, such as spin, charge, or excitation diffusion. The underlying process is described by the resonant exchange cross section. We show that the s-wave scattering, generally thought to contribute mainly in the ultracold (or Wigner) regime, dictates the overall cross section (and rate coefficient) over a broad range of energies. We derive an analytical expression and explain its applicability high above the Wigner regime. In particular, we demonstrate its relationship to the classical capture (Langevin) cross section and apply it to resonant charge transfer, and explain the large variations found for different isotopes. These cannot otherwise be accounted for by the small change in mass.

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Robin Cote
University of Connecticut

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