

Abstract Submitted
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Charge transfer in ultracold atom-ion alkaline-earth systems¹

DIEGO VALENTE, SANDIPAN BANERJEE, ROBIN CÔTÉ, University of Connecticut — We explore the collision properties of alkaline-earth systems comprised of ions and their neutral parent atoms in the low and ultralow energy regimes. The long-range attractive potential ($\sim 1/R^4$) characteristic of atom-ion systems gives rise to collisions involving higher order partial waves that present an important contribution to the cross sections even in the ultracold regime. We calculate the elastic and charge-transfer cross sections using accurate potential curves, and investigate how the quantal treatment of the charge-transfer cross section compares to that of a semiclassical Langevin model. We present calculations for several alkaline-earth systems, including Be-Be⁺, Mg-Mg⁺, Ca-Ca⁺, Sr-Sr⁺, and show how charge transfer processes are highly efficient in these systems.

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