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(G) (POS-55) Interatomic Coulombic Decay in slow He+- and He2+- Ne2 collisions

Tuesday 28 May 2024 17:47 (2 minutes)

We revisit and expand upon previous results (1) related to He2+-Ne2 collisions to analyse electron-removal processes resulting in dimer fragmentation. The standard independent-electron multinomial analysis of single- and multi- electron transitions is compared to a Slater-determinant-based analysis that accounts for the Pauli principle. Given the orientation of a projectile travelling parallel to the dimer axis, we account for electron capture by the projectile from the first atom it interacts with in the dimer. The results indicate strong agreement between the two analyses and confirming our previous prediction of a strong Interatomic Coulombic Decay (ICD) signal at low energies (˜10keV/amu).
For a He+ projectile there is a smaller total ICD cross-section, but no relevant competing process in the Ne+ - Ne+ fragmentation channel. Measuring the kinetic energy release spectrum would indicate a clear ICD signal.

(1) T. Kirchner, J. Phys. B 54, 205201 (2021)

Keyword-1

interatomic Coulombic decay

Keyword-2

low-energy ion collisions

Keyword-3

neon dimers

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