

Abstract Submitted
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Electron Impact Single Ionization of Small Argon Clusters

THOMAS PFLUEGER, ARNE SENFTLEBEN, XUEGUANG REN, ALEXANDER DORN, JOACHIM ULLRICH, Max-Planck-Institut fuer Kernphysik — Atomic and molecular clusters present an excellent field of investigation bridging the gap between sole constituents and macroscopic matter. Therefore, structural as well as dynamical information can contribute to the understanding of more complex systems. We performed kinematically complete electron impact ionization experiments at 100 eV projectile energy where all final state particles were measured and differential cross sections could be obtained over almost the complete solid angle. The dimers show subtle differences compared to monomers in coplanar geometry which are enhanced for out-of-plane detection. Partly, those differences can be attributed to enhanced rescattering of ejected electrons off the core potential. Interestingly, binding energy spectra showed additional reaction channels for monomers and larger clusters but, distinctively not for dimers. These highly excited states in the dimer ion apparently decay by two main mechanisms: below 35 eV the system couples to a dissociating potential producing a monomer ion and an excited neutral, above the ion dissociates because of interatomic coulomb decay (ICD). Besides direct single ionization in larger clusters additional inelastic scattering event inside the cluster exciting a neutral from 3p to 4s was observed.

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