A 8: Collisions, scattering, and correlation phenomena

Time: Tuesday 16:30–18:30 Location: P

A 8.1 Tue 16:30 P

Near-adiabatic collisions of Xe54+ +Xe at the ESR Storage ring — •Siegbert Hagmann[1], Pierre-Michel Hillenbrand[1,2], Jan Glorius[1], Uwe Spillmann[1], Yuri Litvinov[1], Yuri Kozhedub[6], Ilya Tupitsyn[6], Michael Lestinsky[1], Alexander Gumberidze[1,3], Sergij Trotsenko[1,4], Markus Steck[1], Robert Grisenti[1,2], Niikos Petridis[1,2], Shahab Sanjari[1], Carsten Brandau[1], Ester Menz[1], Timo Morgenroth[1], and Thomas Stoehlker[1,4,5] — [1]Helmholtzzentrum GSI, Darmstadt — [2]Inst. f. Kernphysik, Univ. Frankfurt — [3]EMMI GSI-Darmstadt — [4]Helmholtz Inst Jena — [5]Inst.f.Quantenelektronik Univ Jena — [6]Dep Phys. St Petersburg State Univ

We study multi-electron transfer processes in near adiabatic collisions of bare, H-like and He-like Xe54+*52+ ions with Xe atoms and measure emitted target- and projectile K- and L- x rays in coincidence with projectiles which have captured 3 to 6 electrons, and with time of flight of recoiling Xe target ions. Shells beyond the projectile P shell are significantly populated; K x rays from high n shells indicate that outer shell transfer dominantly ends in low l states, decaying directly to the K shell. Single capture favors capture into the 2p3/2 over the 2p1/2 state and multiple capture n*3 the 2p1/2 populates than the 2p3/2 state. For the target K x ray spectra, we observe that the ratio K- satellite/K-hypersatellite yields is enhanced over the predictions by a relativistic theory.

A 8.2 Tue 16:30 P

Atom-molecule and molecule-molecule collisions in NaK quantum gases — •Philipp Gersema[1], Mara Meyer zum Alten Borgloh[1], Kai Konrad Voges[1], Torsten Hartmann[1], Leon Karpa[1], Alessandro Zenesini[2], and Silke Ospelkaus[1] — [1]Leibniz Universität Hannover — [2]Universita di Trento

Ultracold polar ground-state molecules provide an excellent platform for the study of atom-molecule and molecule-molecule collisions in the quantum regime. For endoergic collision channels, it has been suggested that long-lived collisional complexes form which can then be removed from the trap by additional mechanisms such as light-excitation.

Here, we investigate atom-molecule and molecule-molecule collisions in quantum gases of ^{23}Na^{39}K. We probe photo-induced loss of four-body complexes forming in molecule-molecule collisions in chopped optical dipole traps and find the lower limit of the complex lifetime to be much larger than the lifetime derived from RRKM theory.

We also present studies of atom-molecule collisions including loss between molecules and ^{39}K atoms in several spin states.