

Abstract

We studied slow dissociative collisions between He and diatomic molecular ions using Cold Target Recoil Momentum Spectroscopy (**COLTRIMS**) technique in combination with fragment imaging technique. All final state momentum components, as well as the masses of the molecular fragments were determined. As the complete information on the kinematics is available, we are able to calculate the final state binding energy as well as the kinetic energy of the molecular fragments in the molecular center of mass system (kinetic energy release). The results show that the probability of the reaction channels is strongly dependent on the relative geometric orientation of the participants.