

Abstract Submitted
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Signature of Target Excitation In Nitrogen Fragmentation C.P. SAFVAN, JYOTI RAJPUT, SANKAR DE, A. ROY, Inter-University Accelerator Centre, New Delhi - 110067, India — Target excitation following ion-impact has been observed to play a significant role in multi-electron capture studies in ion-atom collision experiments. Probably this is the first report on the role of target excitation in ion-induced fragmentation of nitrogen [1]. The multiple ionization and fragmentation of N_2 by ion impact is studied using position sensitive TOF technique in multi-hit coincidence mode in the LEIBF laboratory of IUAC, India. With Ar^{9+} projectiles at a velocity of 1 a. u., we observe a total of seven fragmentation channels originating from multiply charged transient molecular ions. The kinetic energy release (KER) spectra of all the observed fragmentation pathways were extracted from the analyzed data on an event by event basis. *Ab initio* calculations were done for determining the potential energy curves for multiply charged nitrogen molecular ions to account for the observed KER using the quantum chemistry package GAMESS. The preference of symmetric charge breakup channels over the asymmetric ones is clearly observed. A signature of core excitation of the target molecule followed by Auger emission is observed in the kinetic energy spectra of the N^{3+} - N^{3+} fragmentation channel in the form of a clear distinct peak at 72 eV [1], this value being very close to the most probable KER in the case of N^{2+} - N^{3+} fragmentation channel. Ref: [1] Jyoti Rajput et. al., PRA, 74, 032701 (2006)

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