

Abstract Submitted
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Ion induced dissociation dynamics of acetylene: Signature of vibrational flopping SANKAR DE, I.V. LITVINYUK, J.R. Macdonald Lab, Kansas State Univ, Manhattan, KS 66506, USA, JYOTI RAJPUT, A. ROY, C.P. SAFVAN, Inter-University Accelerator Centre, New Delhi 110067, India, P.N. GHOSH, Dept of Physics, Univ of Calcutta, Kolkata 700009, India — We report the results of dissociation dynamics of multiple charged acetylene molecules formed in collision with 1.2 MeV Ar^{8+} projectiles. Using the coincidence map, we found the evidence for molecular deformation due to a vibrationally active transition state of multiply charged C_2H_2 under the impact of low energy projectiles. ‘Butterfly-like’ structures are observed in the coincidence spectra [1] between hydrogen and carbon ionic fragments. Such structures can be generated by numerical simulations and are found to originate from the bending motion of the dissociating molecule. From the measured slopes of the coincidence islands for carbon atomic fragments and theoretical values determined from the charge and momentum distribution of the correlated particles, we observe a diatom-like behaviour of the C–C charged complex during dissociation of multiply charged acetylene [2]. This is a signature of sequentiality in the breakup dynamics of this multiply charged molecular species. The results will be compared with those obtained in pump-probe experiments using intense few cycle laser pulses. Ref: [1] S. De et al. JCP, 127, 051101 (2007); [2] S. De et. al. PRA (accepted)

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