

Fragmentation of small C_n and C_nH molecules following electronic excitation in high velocity collisions with atoms

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Small carbon and hydrocarbons molecules are abundant species in the interstellar medium. Electronic excitation of these molecules by collisions with free electrons, photons or cosmic ray will generally lead to their fragmentation. Measurements of branching ratios of fragmentation in dissociative recombination (DR) have been performed in some cases on these species, whereas very few measurements exist on photodissociation (PD) or collision induced dissociation (CID). We performed measurements of fragmentation of $C_n^{(q+)}$ and $C_nH^{(q+)}$ molecules following dissociative electron transfer (DCT, $q=0$), dissociative electron excitation (DEE, $q=1$) and dissociative ionization (DI, $q=2-4$) in high velocity (\sim few a.u) collisions of C_n^+ ($n \leq 10$) and C_nH^+ ($n \leq 4$) cations with atoms. The experiments were conducted at the Tandem accelerator in Orsay (France) and all dissociation channels were measured for each specific excitation process. We will present such measurements and discuss the applicability of these measurements to the interstellar medium modelling.