

AU Tuna, T, Chabot, M, Pino, T, Desesquelles, P, Le Padellec, A, Martinet, G, Barat, M, Lucas, B, Mezdari, F, Montagnon, L, Van-Oanh, NT, Lavergne, L, Lachaize, A, Carpentier, Y, Beroff, K  
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TI Fragmentation branching ratios of highly excited hydrocarbon molecules C<sub>n</sub>H and their cations C<sub>n</sub>H<sup>+</sup> (n ≤ 4)

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ID SMALL CARBON CLUSTERS; DISSOCIATIVE RECOMBINATION; CROSS-SECTIONS; AB-INITIO; ASTRONOMICAL IDENTIFICATION; ELECTRONIC-SPECTRA; MODEL-CALCULATIONS; ATOM COLLISIONS; LYING STATES; IONIZATION

AB We have measured fragmentation branching ratios of neutral C<sub>n</sub>H and C<sub>n</sub>H<sup>+</sup> cations produced in high velocity (4.5 a.u) collisions between incident C<sub>n</sub>H<sup>+</sup> cations and helium atoms. Electron capture gives rise to excited neutral species C<sub>n</sub>H and electronic excitation to excited cations C<sub>n</sub>H<sup>+</sup>. Thanks to a dedicated setup, based on coincident detection of all fragments, the dissociations of the neutral and cationic parents were recorded separately and in a complete way. For the fragmentation of C<sub>n</sub>H, the H-loss channel is found to be dominant, as already observed by other authors. By contrast, the H-loss and C-loss channels equally dominate the two-fragment break up of C<sub>n</sub>H<sup>+</sup> species. For these cations, we provide the first fragmentation data (n > 2). Results are also discussed in the context of astrochemistry. (c) 2008 American Institute of Physics.

C1 CNRS IN2P3, Inst Phys Nucl, F-91405 Orsay, France. CNRS, Photophys Mol Lab, F-91405 Orsay, France. Univ Paris 11, Ctr Spectrometrie Nucl & Spectrometrie Masse, F-91405 Orsay, France. Univ Toulouse 3, Inst Rech Syst Atom & Mol Complexes, F-31062 Toulouse, France. CNRS, Collis Atom & Mol Lab, F-91405 Orsay, France. Univ Paris 06, Inst Nanosci Paris, F-75015 Paris, France. CNRS, F-75015 Paris, France. Univ Paris 11, Chim Phys Lab, F-91405 Orsay, France.

RP Tuna, T, CNRS IN2P3, Inst Phys Nucl, F-91405 Orsay, France.

EM karine.beroff@u-psud.fr

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PI MELVILLE

PA CIRCULATION & FULFILLMENT DIV, 2 HUNTINGTON QUADRANGLE, STE 1 N O 1, MELVILLE, NY 11747-4501 USA

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