Fragmentation of hydrocarbons by collision. AGAT@ANDROMEDE.

T. Id barkach[1*], M. Chabot[1], K. Béroff[2], S. Diaz-Tendero[3]

[1]*Institut de physique nucléaire d'Orsay (IPNO), CNRS-IN2P3, Univ. Paris Sud, F-91406 Orsay, France*
[2]*Institut des sciences moléculaires d'Orsay (ISMO), CNRS-IN2P3, Univ. Paris Sud, F-91406 Orsay, France*
[3]*Departamento de Quimica, Modulo 13, Universidad Autonoma de Madrid, 28049 Madrid, Spain*

[*]*idbarkach@ipno.in2p3.fr*

We are studying hydrocarbons ions produced in high velocity (3-4 u.a.) collisions between CH_n^+ cations and Helium atoms. The experiment was done using the AGAT silicon multidetector and the ANDROMEDE accelerator. During the collision those hydrocarbons gain some energy and release this energy by doing fragmentation. Thanks to experimental developments on the fragmentation system, all fragments neutral or charged are separately identified, allowing to resolve all fragmentation channels. Therefore, we have been able to measure fragmentation branching ratios for CH_n^{q+} (n=0-4 and q=0-3).
We also constructed semi-empirical breakdown curves[1] (BDC) for CH_n^{q+} using experimental BR and results of statistical fragmentation theory[2]. These BDC, which are energy dependent dissociation branching ratios (BR) curves, will be used to predict branching ratios for various processes leading to CH_n^{q+} excited adducts. These processes of astrochemical interest are photonic processes, electronic processes and chemical reactions.

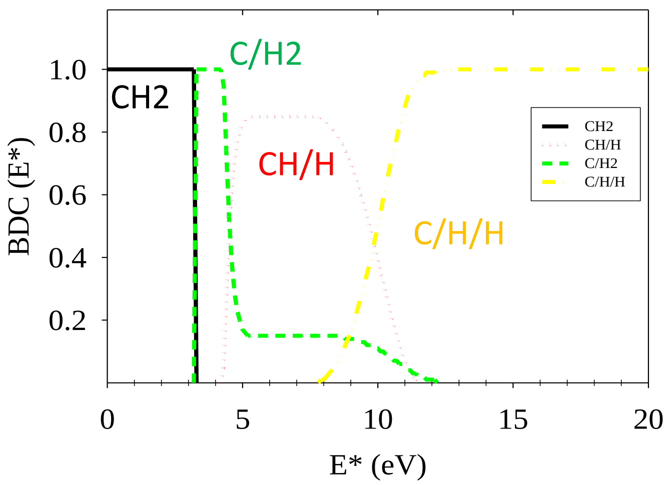

Figure 1: BDC for the reactive intermediate CH_2^*

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References

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