

The fate of COMs during high mass star formation

Sylvain Bontemps¹

¹ *Laboratoire d'Astrophysique de Bordeaux, Université de Bordeaux*

Allée Geoffroy Saint-Hilaire - 33615 Pessac

High-mass stars become extremely luminous while reaching the main sequence as still accreting objects, i.e. as protostars. These large luminosities are believed to trigger dust surface and gas phase chemistry during the so-called hot core phase. In the past, emblematic sources such as SgrB2 (collection of hot cores) or classical hot cores such as G31.41 have proven to be indeed important targets to search for the rarest species found in the interstellar medium with for instance the detection of amino acetonitrile by Belloche et al. (2008) [1] in SgrB2(N) or glycolaldehyde by Beltran et al. (2009) [2] in G31.41. These sources are prime targets for astro-chemistry studies and complex organic molecules (COMs) hunts as they offer both large column densities of gas (often reaching more than 10^{24} cm⁻²) and large fractions of gas at temperatures above ice sublimation and desorption from the dust grains leading to warm/hot gas chemistry and large gas phase abundances of rare species. In order to progress on the precise origin (formation processes) of COMs in hot cores, it is of high importance to fully understand the physical evolution and its interplay with chemistry of young high-mass protostars. I will review the recent results on this topic with a particular emphasis on the earliest phases of the evolution of high-mass protostars which are now at reach with interferometers such as ALMA. These early phases may provide ways to probe the early chemical evolution before complete ice sublimation and desorption, ie at the time of chemistry dominated by dust surface processes. The comparison of young and evolved hot cores could for instance help to discriminate dust surface from gas phase products and help to recognize main formation path for most important COMs. I will also mention recent ALMA results which may challenge the classical view of hot cores as mostly warmed up by radiation.

Références

[1] Belloche A., Menten K., Comito C., Muller H., Schilke P., Ott J., Thorwirth S., Hieret C., *A&A*, 492, 769 (2008)

[2] Beltran M., Codella C., Viti S., Neri R., Cesaroni R., *ApJ*, 690, L93 (2009)