

Molecular richness in protostars: lessons learnt from spectral observations

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The early stages of star formation are characterised by a rich molecular chemistry that can vary substantially from one object to another. Many efforts have been devoted in the past couple of decades to understand the physics and chemistry behind the molecular composition of solar-type protostars. When it comes to molecules containing carbon, diversity is clearly one of the adjectives that best describes the ensemble of findings from these efforts. Indeed, some protostars, known as hot corinos, host significant amounts of interstellar Complex Organic Molecules (iCOMs), such as methyl formate (HCOOCH_3) and formamide (NH_2CHO), while other protostars appear devoid of such molecular species. What causes this chemical diversity? How can we make the chemical link with the origin of our own Solar System in this context? I will present some of the most recent observational results that address these questions, where the IRAM facilities have played a crucial role. Finally, I will briefly emphasise that, while spectral observations are definitely indispensable, they need to be complemented by other tools to solve this and other astrochemical puzzles.