Importance of interstellar dust for the formation of complex molecules in hot cores

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Gas phase model can normally explain observed abundances of the smaller and many other large radicals but they are unable to explain observed abundances of most of the stable and complex, partially organic species in space. It is now well established that dust particles play an essential role towards the chemical enrichment of the ISM. They act as a reservoir and catalytic sites for the formation of complex interstellar species. In order to justify the observed abundances in the hot core region (for Galactic molecular cloud as well as for the Large Magellanic Cloud), two-phase model was emplyed. In the first phase, the cloud remains either in isothermal phase or in collapsing phase. Gas density and temperature can vary in the collapsing phase and dust temperature is calculated by using the empirical relation proposed by Hocuk et al. (2017). In order to make a distinction between the Galactic molecular cloud and Large Magellanic cloud, metallicity effect is included in the relation. The first phase continues for $10^5 - 10^6$ years which is then followed by a subsequent warm-up phase where the temperature can gradually increase up to 200 K in $10^4 - 10^5$ years. In this meeting, I will present my modeling results for the Galactic molecular cloud and Large Magellanic Cloud.