Molecular Formation in Low-Metallicity Hot Cores

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The chemical complexity in low-metallicity hot cores has been confirmed by observations. We investigate the effect of varying different physical parameters, such as temperature, density and cosmic ray ionization rate (CRIR), on the molecular abundance evolution in the low-metallicity hot cores using UMIST gas-phase chemical model. CRIR has the strongest effect on the molecular abundances. The resulted molecular abundances were divided into three categories with different trends in time evolution. We compare our results with the observations of hot cores in Large Magellanic Cloud (LMC). Our model fits the best with the observations at a time around 10^5 years after the evaporation of ices and at the CRIR of 1.36×10^{-16} s^{-1}. The resulted abundances of the oxygen-bearing Complex Organic Molecules (COMs), such as CH_3OH, $HCOOCH_3$ and CH_3OCH_3, don't fit with observations in the same physical condition and may locate in different physical environment. Our results suggest that investigating the CRIR value is crucial in predicting the molecular evolution in the LMC hot cores.