Molecular Signatures in Massive Star Forming Regions

S.-Y. Liu[1]

[1] *Institute of Astronomy and Astrophysics, Academia Sinica, Taiwan, R.O.C.*

Star formation processes not only reshape the physical environment of molecular clouds but also alter the chemical composition in the clouds, such chemical evolution could in turn influence critical physical states of the clouds as well as determine the molecular inventory in the clouds. The chemical signature of different components at various stages of star formation, therefore, is a result of complicated interplay between the chemical processes in gas phase, on grain surfaces and the interactions between gas and grains. Such effect may be particularly important for high-mass star forming regions, since massive star formation process can be very energetic and hence the interactions presumably have more significant impacts, even at very early stages.

Rich molecular complexity has been demonstrated to exist in massive star forming regions. For example, the so-called "hot molecular cores" are characterized by enhanced abundances of complex and highly-saturated organic molecules, which is likely to be resulted from surface reactions and/or UV-radiation, comic ray processing during the collapse phase and mantle evaporation after the onset of central massive stars. However, our understanding of the chemical condition for the precursors of high mass stars is still far from complete. What are their unique chemical characteristics? Do they have any molecular signature similar to the cold dark clouds? Or significant chemical evolution has already occurred? In this contribution, I will review recent results from observations of massive star formation regions, with some emphasis over high angular resolution studies with interferometric arrays.