[구SF-05] HCN and HNC observation toward three different phases of massive star formation

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It has been known that HCN is one of ubiquitous high-density gas tracer, and the abundance ratio between HCN and its Isomer, HNC sensitively depends on kinetic temperature in star-forming regions. Here we investigate the molecular abundance ratio toward three different evolutionary phases of massive star formation: Infrared Dark Clouds, High-mass Protostellar Objects and Ultracompact HII Regions.

We obtained the abundances of HCN and HNC using optically thin H13CN and HN13C lines observed with the KVN single-dish telescopes and MAMBO 1.2mm and SCUBA 850μm continuum data.

According to our results, the ratio of [HCN]/[HNC] increases statistically with the evolutionary stage, indicative of the effect of temperature. We also found a strong anti-correlation between the column density of molecular hydrogen and the HNC abundance.

[구SF-06] The warm CO gas along the UV-heated outflow walls: a possible interpretation for the Herschel-PACS CO spectra of embedded YSO

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Part of mid-J CO emission detected by the Herschel/PACS observations of embedded young stellar objects (YSOs) has been attributed to the UV-heated outflow walls. We have applied our newly developed self-consistent models of Photon Dominated Region (PDR) and Non-LTE line Radiative transfer In general Grid (RIG) to the Herschel FIR CO observations. If the black body radiation of T = 15,000 K is used, the observed mid-J CO line fluxes can be produced in inner dense regions (n ≥ 106 cm-3) with −4.5 ≤ log Gdust/n ≤ −2.5, where gas temperatures are larger than 300 K and CO abundances are ≥ 10-5, along the UV-heated outflow walls. The contribution of the UV heated outflow cavity wall in Class I seems to be larger than that in Class 0.