

P125a Investigation of roles of the UV radiation on the chemistry around protostars in the Ophiuchus region

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We have investigated chemical compositions around two young stellar objects (YSOs), EES2009 and GY92, in the Ophiuchus star-forming region, using Atacama Large Millimeter/submillimeter Array (ALMA) Cycle 4 in Band 6 data. Molecular lines from *cyclic*-C₃H₂ (*c*-C₃H₂), H₂CO, CH₃OH, ¹³CO, C¹⁸O, and DCO⁺ have been detected from both sources, while DCN is only detected in GY92. We derive the $N(c\text{-C}_3\text{H}_2)/N(\text{CH}_3\text{OH})$ column density ratios around two YSOs and find that *c*-C₃H₂ is significantly enhanced in a GY92 region irradiated by a nearby Herbig Be star. On the other hand, H₂CO and CH₃OH are abundant in a more shielded region. These spatial differences between *c*-C₃H₂ and H₂CO/CH₃OH imply that *c*-C₃H₂ is efficiently formed by bottom-up and/or top-down mechanisms. We will also discuss the deuterium fractionation mechanisms around each YSO, using the DCO⁺ and DCN data. The DCO⁺ ion around GY92 is likely formed by a reaction of “HCO⁺ + D → DCO⁺ + H₂” in relatively warm regions (30 < *T* < 100 K), while this ion around EES2009 seems to be formed by a reaction of “H₂D⁺ + CO → DCO⁺ + H₂” in cold regions (< 30 K).