

Observations of fresh sublimates in FU Ori disks

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Molecular line observations of protoplanetary disks have been intensively performed at ALMA. Detection of complex organic molecules (COMs) is of special interest, since the comparison of their abundances in disks with the cometary material could tell us a chemical link between the interstellar matter and planetary-system (Solar system) material. Although CH₃OH and CH₃CN have already been detected, COMs observation in disks are challenging, because the sublimation temperature of COMs are rather high. Another problem is that the molecular abundances in gas and ice should be basically different. Since comets are made from ices rather than gas, it is better to observe, if possible, the ice composition in disks. In this presentation, we propose to observe FU Ori disks to derive ice composition in protoplanetary disks. FU Ori objects are in temporal luminosity outburst, which is caused by temporal increase in accretion rate. The disk temperature rises, and the snow line moves outward in the disk. Since the sublimation temperature of COMs are often similar to that of water ice, COMs are sublimated inside the water snow line. Once sublimated, COMs are destroyed by the gas-phase reactions. The destruction timescale is, however, longer than a typical duration of the outburst. Therefore, FU Ori disks are an ideal target to observe the fresh sublimates to derive the ice composition in the quiescent phase of the disk. We will also present preliminary results of the analysis of ALMA archive data.

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