

Q16a **Discovery of Absorption Features of CH₃NH₂ towards SgrB2(M)**

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There is a wide agreement that complex organic molecules (COMs), such as amino acids, are crucial material for life. There has been a hot debate where such COMs were formed, on the Earth or in the Universe. Ehrenfreund et al. (2002) suggested that exogenous delivery of COMs to the primitive Earth would be much larger by three orders of magnitude than terrestrial formation of COMs. Thus it would be crucial to study what and how much COMs exist in star and planet forming regions.

Methyl amine (CH₃NH₂) has been proposed as a precursor to glycine through reaction with CO₂ under UV irradiation (Holtom et al. 2005; Kim & Kaiser, 2011). Based on such laboratory studies it is possible to assume possible formation paths from simple and rich molecular species (CH₄, NH₃, CO₂ and HCN) to glycine.

Since there are a very small number of studies on interstellar CH₃NH₂ since its detection by Kaifu et al. (1974), we conducted survey observations of CH₃NH₂ towards several star-forming regions by using the Nobeyama 45m radio telescope in April 2013. During this survey we discovered three low-energy CH₃NH₂ lines in clear absorption against the radio continuum emission towards SgrB2(M). By assuming the LTE condition, we were able to estimate its excitation temperature to be about 4 K and its column density to be $\sim 5 \times 10^{15} \text{cm}^{-2}$, respectively. The column density corresponds to a fractional abundance to H₂ to be $\sim 10^{-9}$. Our detection may suggest that CH₃NH₂ would be widely distributed even in cold molecular clouds.