FTMW SPECTROSCOPY OF CH$_2$NC ($\tilde{X}^2B_1$) $\sim$ A POSSIBLE CANDIDATE OF INTERSTELLAR MOLECULE

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Cyanohydrocarbons are molecules of great importance in cold dark clouds such as TMC-1. Due to such interests, CH$_2$CN has been studied by experimental and theoretical means, and these extensive investigations lead unambiguous identification of the molecule in interstellar matter. It turns out that an isomer CH$_2$NC was rarely studied experimentally, probably because of unstablility of this species compared with CH$_2$CN.

We recently recorded Fourier transform microwave (FTMW) spectra of CH$_2$NC at the University of Tokyo. About 0.3$\sim$1 percent of CH$_2$NC, synthesized by an ordinary way, was diluted in the Ar or Ne buffer gas at the pressure of $\sim$1 atm. The mixed gas was injected into the Fabry-Pérot cavity via a pulsed nozzle, whose opening was synchronized with high voltage dc pulse to discharge to generate the aimed species. $N=1_{10}$-0$_{00}$ ($\sim$ 22.2 GHz), 2$_{02}$-1$_{01}$, 2$_{12}$-1$_{11}$, and 2$_{11}$-1$_{10}$ ($\sim$ 44.4 GHz) were recorded with well resolved fine and hyperfine structure. The molecular structure as well as a possibility of detection of this molecule will be discussed.