CONFIRMATION OF INTERSTELLAR METHYLCYANODIACETYLENE

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Ten spectral lines of the symmetric top molecule methylcyanodiacetylene ($CH_3C_5N$) have been detected with the 100-m Green Bank Telescope (GBT) toward the Taurus molecular cloud TMC-1. Both K=0 and K=1 components of the 12,K-11,K, 13,K-12,K, 14,K-13,K, 15,K-14,K, and 16,K-15,K transitions were observed. Consistent with $\sim$10 K kinetic temperature for the TMC-1 dark dust cloud, no higher K components were detected. The $CH_3C_5N$ excitation temperature range is 2.7 K to 4.0 K for both K=0 and K=1 ladders, similar to that previously reported for methylcyanoacetylene ($CH_3C_3N$). The abundance ratio of $CH_3C_5N$ to $CH_3C_3N$ is in the range of 0.5 to 1, but most probably closer to $\sim$0.5 than 1. Methyl cyanide ($CH_3CN$), $CH_3C_3N$, and $CH_3C_5N$ are all found in TMC-1 in decreasing relative abundance, suggesting that simple carbon addition may be possible in dark clouds.