A new interstellar molecule, CH$_3$NCO (methyl isocyanate), has been detected for the first time using the 12 m telescope of the Arizona Radio Observatory (ARO). CH$_3$NCO was identified in spectra covering 68 - 116 GHz in the 3 mm segment of a broadband survey of Sgr B2(N). This study was based on previous laboratory work by Koput (1986) and new Fourier transform millimeter-wave (FTmmW) measurements performed at Arizona in the 60 - 88 GHz range. Spectroscopic constants were determined for CH$_3$NCO in a combined fit, and were used to predict other transitions at 3 mm.

Thirty very favorable rotational lines ($K_a = 0$ and $K_a = 1$ only; $E_u < 60$ K) originating in five consecutive transitions of CH$_3$NCO in both the A and E internal rotation states were found to be present in the Sgr B2(N) survey from 68 - 105 GHz. Emission was observed at all of the predicted frequencies, with 17 lines appearing as distinct, uncontaminated spectral features, clearly showing the classic a-type, asymmetric top pattern. The CH$_3$NCO spectra also appear to exhibit two velocity components near $V_{LSR} \approx 62$ and 73 km s$^{-1}$, both with $\Delta V_{1/2} \approx 10$ km s$^{-1}$, typical of most molecules in Sgr B2(N). The fractional abundances were determined to be $f = 7.6 \times 10^{-12}$ and $5.0 \times 10^{-12}$ for the 62 and 73 km s$^{-1}$ components, relative to H$_2$, respectively. CH$_3$NCO was recently detected in volatized material from comet 67P/Churyumov-Gerasimenko by Rosetta’s Philae lander.