FOURIER TRANSFORM EMISSION SPECTROSCOPY OF THE $A^2\Pi$–$X^2\Sigma^+$ (RED) SYSTEM OF $^{13}C^{14}N$.

R.S. RAM, *Department of Chemistry, University of York, Heslington, York, YO10 5DD, UK; Department of Chemistry, University of Arizona, Tucson, AZ 85721, USA*; and P.F. BERNATH, *Department of Chemistry and Biochemistry, Old Dominion University, Norfolk, VA 23529 USA; Department of Chemistry, University of York, Heslington, York, YO10 5DD, UK*.

High resolution emission spectra of the $A^2\Pi$–$X^2\Sigma^+$ transition of $^{13}C^{14}N$ have been measured in the 15000–24000 cm^{-1} region. Molecules were produced by the reaction of $^{13}CH_4$ and $^{14}N_2$ in an active nitrogen afterglow discharge. The spectra were recorded using the Fourier transform spectrometer associated with the McMath-Pierce Solar Telescope of the National Solar Observatory. A rotational analysis of 27 bands involving the excited state vibrational levels $v' = 9$–22 and the ground state vibrational levels up to $v'' = 12$ has been obtained. A much improved set of spectroscopic constants have been determined for the v = 0–22 vibrational levels of the $A^2\Pi$ state by combining the present measurements with those reported previously for the v = 0–8 vibrational levels of the $A^2\Pi$ state[a] and existing infrared and millimeter-wave measurements of $^{13}C^{14}N$. The 6–3, 7–4, 8–5 and 9–6 bands of the $B^2\Sigma^+$–$A^2\Pi$ transition were also identified in the 23300–24000 cm^{-1} region and were included in the final analysis. An experimental line list and calculated term values are provided.

[a] Ram et al., Astrophys. J. Suppl. Ser., 188, (2010), 500.