# $\nu_1$+$\nu_5$ OF HCCN: DETERMINATION OF THE $\nu_5$ VIBRATIONAL ENERGY

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The high resolution infrared spectrum of HCCN in the region 3338- 3382cm$^{-1}$ has been observed by infrared kinetic spectroscopy. The spectrum is assigned as the combination band $\nu_1$+$\nu_5$ of the quasilinear molecule HCCN with the origin at 3355.510(9)cm$^{-1}$. Based on information from the $\nu_1$+$\nu_5$-$\nu_5$ spectrum[1], the energy of the lowest excited state with angular momentum about the a-axis, $\nu_5$, is determined to be 128.913(9)cm$^{-1}$. This value is lower than the results obtained by means of relative intensity measurements on the millimeter-wave spectra[2] [145(15)cm$^{-1}$] or from similar relative intensity measurements on the IR spectra[1] [187(20)cm$^{-1}$]. The present value of the energy for $\nu_5$ predicts a barrier to linearity similar to that obtained from the corresponding band of DCCN[3] and is higher than that found by McCarthy et al.[2].

[1] C. L. Morter, S. K. Farhat and R. F. Curl, Chem. Phys. Lett. 207, 153(1993); [2] M. C. McCarthy, C. A. Gottlieb, A. L. Cooksy and P. Thadeus, J. Chem. Phys. 103(18), 7779(1995); [3] Fuge Sun, A. Kosterev, G. Scott, V. Litosh, and R. F. Curl, J. Chem. Phys. 109(20), 8851(1998).