A LOOK AT NITRILE CHEMISTRY IN SGR B2(N) USING THE COMBINED POWER OF THE GBT AND THE VLA

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Nitriles form the most prolific family of molecules known in the ISM, and laboratory work shows that radical-driven chemistry can account for the formation of a diverse set of nitrile and imine molecules. Broadband reaction screening of nitrile chemistry in a pulsed discharge nozzle coupled to a chirped-pulse Fourier transform rotational spectrometer has enabled detections of several new interstellar species including E- and Z-ethanimine[a] and E-cyanomethanimine[b]. The detections were made by direct comparisons of laboratory broadband rotational spectra with the Robert C. Byrd Green Bank Telescope (GBT) PRebiotic Interstellar MOlecule Survery (PRIMOS) survey towards Sgr B2(N), the most chemically complex interstellar region known. In order to probe nitrile chemistry in Sgr B2, we targeted low energy rotational transitions in the 18-21 GHz range of several nitriles with the Karl G. Jansky Very Large Array (VLA) at $\sim$1 arcsecond resolution. The data indicate that most nitriles and nitrile derivatives are co-spatial with shell shaped continuum features thought to be expanding ionization fronts. The CH2CN radical and imine species in particular are NOT associated with the hot core known as the "Large Molecule Heimat", where most large organic molecules are thought to reside. This result suggests radical driven nitrile chemistry may be promoted by near-UV radiation in moderate density regions of molecular clouds, and the data will be useful for evaluating possible formation mechanisms.

[a]R.A. Loomis et al. *Ap. J. L.* **765**(L9), 2013.
[b]D.P. Zaleski et al. *Ap. J. L.* **765**(L10), 2013.