EXPLORING MOLECULAR COMPLEXITY WITH ALMA (EMOCA): COMPLEX ISOCYANIDES IN SGR B2(N)

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The EMoCA survey is a spectral line survey using the Atacama Large Millimeter/submillimeter Array (ALMA) to study the hot-core complex Sagittarius B2(N). Recently, EMoCA revealed the presence of 5 hot cores in this complex, including N2, which is a rich source for the study of complex molecules due to its narrow linewidths. We seek to analyze data from the EMoCA survey to investigate the column densities and excitation temperatures of nitrile and isonitrile (i.e., cyanide and isocyanide) species. We report the first detection of CH_3NC and $HCCNC$ in Sgr B2(N2). In addition, we calculate new upper limits for C_2H_5NC, C_2H_3NC, HNC_3 and HC_3NH^+. We then use the coupled three-phase chemical kinetics code *MAGICKAL* to simulate their chemistry. Several new species, and over 100 new reactions have been added to the network. In addition, a new single-stage collapse/warm-up model has been implemented, thus eliminating the need for the previous two-stage models. A variable, visual extinction-dependent ζ is also incorporated into the model. Our updated chemical models do a reasonable job of reproducing the abundance ratios of the various isocyanide/cyanide pairs, with the best-fit model having an enhanced cosmic-ray ionization rate. Radiative transfer models are run on the best-fit chemical model. Column densities produced by the radiative transfer models are lower than those determined observationally. Excitation temperatures are reproduced for some molecules, but not others, indicating there is still work to be done on the model. The new single-stage chemical model should be a useful tool in analyzing other hot-core sources in the future.