SOLID N2 SURFACE STUDIES, FUNDAMENTAL AND FIRST OVERTONE REGIONS

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Infrared emission spectra of N_2, frozen onto a Cu plate at 10K, were obtained in the N_2 fundamental region near 5 μm, and in the first overtone region near 2.6 μm, at 0.003 μm resolution. The solid N_2 was excited by N_2 gas passed through the microwave discharge of the COCHISE (COld CHemical Infrared Simulation Experiment) reaction cell, and the emissions were measured by a cryogenic monochromator. Spectra were obtained for various mole fractions of N_2 in Ar in the discharge flow. Counterflows of non-excited N_2 or Ar were also investigated. Lines of the 1-0 and 2-0 bands, and in some spectra the 3-1 band, were identified. In addition, ground state vibrational excitation up to the A-state energetic limit was observed. The dependence of these spectra on the composition of the discharge flow and the counterflow will be discussed.