

## CAVITY RING-DOWN LASER ABSORPTION SPECTROSCOPY OF THE $E^3\Delta - X^3\Delta$ TRANSITION OF VN

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The (0,0) band of the electronic transition of VN at around 450.5 nm has been investigated using the technique of laser vaporization/reaction with free jet expansion and cavity ring-down laser absorption spectroscopy. A new transition system was observed, which has been designated as the  $E^3\Delta - X^3\Delta$  system. All three  $\Delta\Omega = 0$  subband transitions were recorded and rotationally analyzed. Least squares fit of the measured line positions yielded molecular constants for the new  $E^3\Delta$  state. The bond length of the  $E^3\Delta$  state was determined to be 1.6937 Å, which is the longest among the known states of VN. The  $E^3\Delta$  state is expected to arise from an electronic configuration  $1\delta^1 10\sigma^1$  where the  $10\sigma$  orbital is an antibonding orbital. A comparison of the observed electronic states of the isoelectronic TiO molecule supports the assignment.