THE JET-COOLED HIGH RESOLUTION $\tilde{A}^2E''$-$\tilde{X}^2A_2'$ VIBRONIC BANDS OF NO_3

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The 0_0^0, 4_0^1, 4_0^2 and 2_0^1 vibronic bands of the $\tilde{A}$ state NO_3 absorption spectrum has been successfully observed with our high-resolution, jet-cooled cavity ring-down apparatus. Ground state combination differences[bc] are used to analyze all four vibronic bands. Rotational transitions of the 4_0^1 band (parallel band) band are assigned including some levels that appear to be doubled. The 4_0^2 band verifies the existence of anomalous doublets in both the 4_0^1 and 4_0^2 bands. The 2_0^1 band is a perpendicular band which has a different band type. Preliminary assignments of this band are utilized for the comprehensive understanding of the structure of NO_3 in the $\tilde{A}$ state. Besides the ν_2 and ν_4 vibronic bands, the vibronically forbidden origin band (0_0^0 band) has also been recorded. The weakly observed $\tilde{A}$-$\tilde{X}$ origin band structure appears to be different from either the parallel or perpendicular band type and is likely a magnetic dipole transition.

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