ULTRAHIGH-RESOLUTION SPECTROSCOPY AND THE ZEEMAN EFFECT OF THE $B^2E' \leftarrow X^2A_2'$ TRANSITION OF NITRATE RADICAL NO_3

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The nitrate radical NO_3 has been known as an important intermediate in chemical reaction in the night atmosphere. The $B\ ^2E' \leftarrow X\ ^2A_2'$ transition has been known as an intense absorption in the visible region ($T_0 \approx 15108$ cm^{-1}). The rotational structure of the 0-0 band of the $B\ ^2E' \leftarrow X\ ^2A_2'$ transition has been reported by Carter *et al.*[a], but the rotational assignment is still remained because the spectrum is too complicated. In this work, we measured the rotationally resolved high-resolution fluorescence excitation spectra of the 0-0 band of NO_3 $B\ ^2E' \leftarrow X\ ^2A_2'$ transition by crossing a single-mode laser beam perpendicular to a collimated molecular beam in the range of 15080-15135 cm^{-1}. In our spectrum, the typical linewidth was 25 MHz and the absolute wavenumber was calibrated with accuracy 0.0001 cm^{-1} by measurement of the Doppler-free saturation spectrum of iodine molecule and fringe pattern of the stabilized etalon. Additionally, we have observed the change of the spectra with magnetic field. We are trying to assign the observed rotational lines by using the observed Zeeman splitting and the conbination difference in the ground state calculated from the molecular constants reported by Kawaguchi *et al.*[b]

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[a] R. T. Carter, K. F. Schmidt, H. Bitto, and J. R. Huber, *Chem. Phys. Lett.*, **257**, 297 (1996).

[b] K. Kawaguchi, E. Hirota, T. Ishiwata, and I. Tanaka, *J. Chem. Phys.*, **93**, 951 (1990).