FTIR SPECTROSCOPY OF THE ν_4 BANDS OF $^{14}NO_3$ and $^{15}NO_3$

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High-resolution Fourier transform infrared spectra of the NO_3 ν_4 bands of ^{14}N and ^{15}N isotopic species were observed in the 365 and 360 cm^{-1} region. Observed lines were used to determine ΔK=3 combination differences of the ground state coupled with transition frequencies of the ν_3 hot band ν_3 + ν_4 - ν_4 in 1127 cm^{-1} region[a] and ν_3 + ν_4 band in 1492 cm^{-1} region, which made it possible to determine the rotational C_0 constants of 0.228 6321(67) cm^{-1} and 0.228 674(11) cm^{-1} for $^{14}NO_3$ and $^{15}NO_3$, respectively. Inertial defects of several vibrational states were calculated by using a formula of Jagod and Oka[b] and compared with the observed values. Although the observed Coriolis coupling constants ζ_4=-0.188 ($^{14}NO_3$) and -0.156 ($^{15}NO_3$) are largely different from the expected value of -0.7 from a force field calculation, observed inertial detects are in good agreement with calculated values, for example, Δ_{obs}(Gr.)= 0.206 [0.223] amuÅ^2, (v_4=1) 0.434[0.437] amuÅ^2 etc, where calculated values are given in square brackets.

[a] K. Kawaguchi, N. Shimizu, R. Fujimori, J. Tang, T. Ishiwata, and I. Tanaka, *J. Mol. Spectrosc.* **268**, 85 (2011).
[b] M.-F. Jagod and T. Oka, *J. Mol. Spectrosc.* **139**, 313 (1990).