FOURIER TRANSFORM EMISSION SPECTROSCOPY OF NEW ELECTRONIC TRANSITIONS OF VN AND VO

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The emission spectra of VN and VO have been investigated in the 3700-18300 cm^{-1} region using a Fourier transform spectrometer. The spectra of both these species were observed in the same experiment from the microwave excitation of $VOCl_3$ vapor in active nitrogen. Several new bands were observed and assigned to new electronic transitions of VN and VO. For VN, two new electronic transitions were observed with their 0-0 bands near 14293 cm^{-1} and 5267 cm^{-1}. These transitions have been assigned as the $c^1\Pi$ - $a^1\Delta$ and $d^1\Sigma^+$ - $b^1\Sigma^+$ transitions, respectively. The $d^1\Sigma^+$ state of VN is the only known singlet state to date which was seen previously from the $d^1\Sigma^+$ - $X^3\Delta_1$ transition near 16220 cm^{-1} by Simard et al.[J. Mol. Spectrosc. **136**,44 (1989)]. For VO, the $1^2\Phi$ - $1^2\Delta$ transition near 5545 cm^{-1} has been observed for the first time, although the $1^2\Phi$ and $1^2\Delta$ states have previously been seen by Merer et al. [J. Mol. Spectrosc. **125**, 465, (1987)] from other transitions. A rotational analysis of the new bands provides valuable information on the low-lying electronic states of VN and VO.