THE ν_2 BENDING POTENTIAL OF THE $\tilde{X}\ ^2\Sigma^+$ STATE OF MgNC

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We have generated MgNC in supersonic free jet expansions, and observed the laser induced fluorescence (LIF) of the $\tilde{A}\ ^2\Pi$ – $\tilde{X}\ ^2\Sigma^+$ transition. We measured the LIF dispersed fluorescence spectra from the single vibronic levels (SVL) of the Mg-N-C bending (ν_2) mode in the upper $\tilde{A}\ ^2\Pi$ state. The vibronic structures in the SVL dispersed spectra were analyzed according to customary procedure. On the basis of the results, we discuss the vibrational structure of the ground $\tilde{X}\ ^2\Sigma^+$ state of MgNC and the potential surface of the isomerization reaction, MgNC $\leftrightarrow$ MgCN. In our previous work[a], we also applied the internal rotation model to analyze the bending vibrational structure, and derived the isomerization reaction potential surface, a part of which corresponds to the ν_2 bending potential. In the internal rotation model, the wavefunctions of the ν_2 bending mode are expanded using those of the plane free rotor; i.e. this means that we treated only the l = 0 component. On the present work, we expand the wavefunctions using spherical harmonics, and derive the potential using all of the observed bending levels.

[a] M. Fukushima and T. Ishiwata, *60th International Symposium on Molecular Spectroscopy*, TC03 (2005).