HIGH-RESOLUTION F. T. SPECTRUM OF A - X BAND SYSTEM OF MgCl

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The A $^2\Pi_r$ - X $^2\Sigma^+$ system of MgCl molecule (360-380 nm) has been recorded on BOMEM DA8 Fourier transform spectrometer at an apodized resolution of 0.035 cm^{-1}. The spectra have been excited under flowing conditions in a demountable stainless steel hollow cathode lamp (400 V, 250 mA) containing anhydrous $MgCl_2$ and Ar. The resulting spectra are very intense and 0-0, 1-1 and 1-0 bands of A $^2\Pi_{1/2}$ - X $^2\Sigma^+$ sub-transition and 0-0 band of A $^2\Pi_{3/2}$ - X $^2\Sigma^+$ sub-transition have been recorded and rotationally analyzed. Molecular constants have been derived using a least-squares fit programme in which optical data[a] of 0-1 and 0-2 bands (A $^2\Pi_{1/2}$ - X $^2\Sigma^+$) was also included. The Λ-doubling constants in the v = 0, 1 levels of the sub-state A $^2\Pi_{1/2}$ are as expected, i.e. $p_1 > p_0$, whereas it is found that the spin-doubling constants of the v = 0, 1, 2 levels of the ground state decrease with the increase in v, i.e., $\gamma_0 > \gamma_1 > \gamma_2$. This is indicative of presence of some nearby state, influencing the spin-doubling in the ground state. The final results of the rotational analysis will be presented.

[a] M. Singh, G. S. Ghodgaonkar, and M. D. Saksena, Can. J. Phys. 65, 1594 (1987).