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

M.D. SAKSEN, SUNANDA. KUMAR, Spectroscopy Division, Modular Laboratories, Bhabha Atomic Research Centre, Trombay, Mumbai 400 085; M.N. DEO, Synchrotron Radiation Section, Modular Laboratories, Bhabha Atomic Research Centre, Trombay, Mumbai 400 085; S.H. BEHERE, Prof., Dr. Babasaheb Ambedkar Marathwada University, Aurangabad 431 004; ASHOK. JADHAV, Lecturer, New Arts, Commerce and Science College, Ahmednagar 414 001. INDIA.

The A ^2Π - X ^2Σ^+ 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 MgCl₂ and Ar. The resulting spectra are very intense and 0-0, 1-1 and 1-0 bands of A ^2Π₁/₂ - X ^2Σ^+ sub-transition and 0-0 band of A ^2Π₃/₂ - X ^2Σ^+ 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 ^2Π₁/₂ - X ^2Σ^+ ) was also included. The A-doubling constants in the v = 0, 1 levels of the sub-state A ^2Π₁/₂ are as expected, i.e. p₁ > p₀, 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., γ₀ > γ₁ > γ₂. 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.