

A Study of Perturbations of the $A^1\Sigma_u^+$ State of Na_2

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High resolution Fourier spectrometry techniques have been used to study the $A^1\Sigma_u^+$ state, which is perturbed by the $b^3\Pi_u$ state of the Na_2 molecule. This study was achieved by means of exciting the $B^1\Pi_u$ state from the $X^1\Sigma_g^+$ ground state by 4880 Å and 4965 Å lines of an Ar^+ laser. The excitation is followed by collisional transfer energy produced between $B^1\Pi_u$ and $(2)^1\Sigma_g^+$ states, which led to the population of the vibrational levels of the $(2)^1\Sigma_g^+$ state v . The analysis of the collision-induced system $(2)^1\Sigma_g^+ - A^1\Sigma_g^+$ enabled us to study, in detail, the perturbations of 11 vibrational levels from $v = 0$ to $v = 10$ of the $A^1\Sigma_u^+$ state.

Key words: Perturbations; Vibrational Levels; Molecular Constants; Excited State $A^1\Sigma_u^+$.