

71. Vibrational Relaxation of Vibrational Levels Create Population Inversion Continuously on About 21 Transitions

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ABSTRACT

We compute the electron impact excitation rate coefficients of vibrational levels of $C^3 \Pi_u$, $B^3 \Pi_g$ and $A^3 \Sigma_u$ electronic systems of N_2 molecule and show that the population inversion may be obtained on 77 transitions of first and positive system. The laser action has been observed on 7 transitions in second positive system and 14 transitions in first positive system. It has been predicted by proper adjustment of laser parameters amplification may be obtained at remaining wavelengths also. Furthermore it has been shown that the vibrational relaxation de-populates the higher vibrational level and populates the vibrational level with $v=0$. This shows that the population inversion may be generated continuously on about 10 transitions.