

PERTURBATIONS OF THE $A'^1\Pi$ AND $C^1\Sigma^+$ STATES OF CaO

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The electronic structure of CaO is complex due to the large number of low-lying energy states and a multitude of rovibronic interactions among them. Several vibronic bands of the $A'^1\Pi - X^1\Sigma^+$ CaO have been identified in the visible region using laser induced fluorescence. Analysis of these rotationally resolved data provides more accurate band origins and rotational constants for levels that were previously determined indirectly using perturbation data. Fluorescence decay lifetime measurements were used to determine the radiative decay rate for the A' state.

A previously noted homogeneous perturbation of the $C^1\Sigma^+$ state was examined to determine the identity of the perturbing state. Dispersed fluorescence spectra and fluorescence decay rate measurements were used to show that the perturbation results from the interaction with a state of $^3\Pi(0+)$ symmetry.