

PERTURBATION AND PREDISSOCIATION OF THE Na₂ 3³Π_g AND 4³Σ_g⁺ STATES

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The Na₂ 3³Π_g and 4³Σ_g⁺ states dissociate adiabatically to the 3s+4p atomic limit. Energy levels below the 3s+3d atomic limit of these two states have been observed by perturbation facilitated optical-optical double resonance (PFOODR) fluorescence excitation spectroscopy.^[a,b] Energy levels above the 3s+3d atomic limit could not be observed by detecting molecular fluorescence but have been observed recently by detecting atomic 3d → 3p fluorescence. The 3³Π_g and 4³Σ_g⁺ states interact with the 3s+3d 2³Π_g and 3³Σ_g⁺ states, respectively. As a result of the perturbation the 3³Π_g state strongly predissociates and the linewidth of levels close to the 3s+3d limit is about 15cm⁻¹. The 4³Σ_g⁺ state is weakly predissociated.

^aLi Li and R. W. Field, *J. Mol. Spectrosc.* 117, 245 (1986).

^bLi Li and M. Li, *J. Mol. Spectrosc.* 173, 25 (1996).