

## HIGHLY PREDISSOCIATIVE LEVELS OF THE CH<sub>3</sub>S $A^2A_1$ STATE DETERMINED WITH DEGENERATE FOUR-WAVE MIXING

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We have determined highly predissociative levels of the  $A^2A_1$  state of CH<sub>3</sub>S in a supersonic jet with degenerate four-wave mixing (DFWM) technique. The highest level observed lies 4265 cm<sup>-1</sup> above the zero-point-energy level, much greater than corresponding values of 2979 cm<sup>-1</sup> observed by fluorescence depletion spectroscopy and 1490 cm<sup>-1</sup> by laser-induced fluorescence. Unlike in fluorescence spectra, relative intensities of lines in DFWM spectra closely reflect their Franck-Condon factors; vibronic assignments are thus more straightforward. A new progression involving excitation of the CH<sub>3</sub> stretching mode is identified, and several lines in the range 1290-1410 cm<sup>-1</sup> above the origin may be assigned to the CH<sub>3</sub> deformation ( $\nu_5$ ) and the first overtone of CH<sub>3</sub> rocking ( $2\nu_6$ ) modes. Observed vibrational wave numbers are consistent with theoretical predictions.