ROTATIONAL ANALYSIS OF A-E AND E-E VIBRONIC BANDS OF CF_3S

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Rotationally resolved spectra of jet-cooled CF_3S have been obtained. The rotational analysis of the origin band shows that it is an a-e type vibronic transition. This is also consistent with the $\tilde{A}\ ^2A_1$ - $\tilde{X}\ ^2E$ electronic transition, expected for molecules of this type. This indicates that CF_3S has nominal C_{3v} symmetry in both its ground and first excited electronic state.

In addition to the origin band, several transitions to excited vibrational levels of the $\tilde{A}$ state have been observed. Some of these transitions are vibronically a-e while others appear to be e-e, presumably induced by Jahn-Teller interaction in the $\tilde{X}$ state. The analysis of an e-e band proves to be a challenge. Its appearance is quite different from that of the a-e bands. The rotational structure of the a-e band is very congested since the entire band spans only 4 cm^{-1}. However, the e-e band spans more than 7 cm^{-1} with a concomitant decrease in line density. Most of the observed rotational lines in the e-e band belong to Q branches. The P and R branches do exist but the intensities are much weaker than the corresponding Q branches. The details of analysis will be presented.