VIBRATIONAL PREDISSOCIATION OF THE $\tilde{A}$ STATE OF THE C$_3$Ar COMPLEX IN THE EXCITATION ENERGY REGION OF 25410-25535 CM$^{-1}$

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About 11 C$_3$Ar bands near the 0 4$^+$ 0-000 and 0 2$^+$ 0-000 transitions of the $\tilde{A}$$^1Π_u$$^\circ$$-$$\tilde{X}$$^1Σ^+_g$ system of C$_3$ have been studied by both laser-induced fluorescence and wavelength-resolved emission techniques. Two prominent pairs of C$_3$Ar features were observed to the red of each of these two C$_3$ transitions. Each pair consists of a type A band and a type C band, with the type C band lying about 3 cm$^{-1}$ above the type A band. Rotational analysis showed that three of the bands are comparatively sharp, with line widths of 0.035 cm$^{-1}$, but the pair at 25504 and 25507 cm$^{-1}$ shows clear evidence of diffuseness. The spectral widths of the rotational lines do not depend on the excitation energies in any simple way. Most of the features in the wavelength-resolved emission spectra can be assigned as emission from vibrationally excited levels of the $\tilde{A}$ state of the C$_3$ fragments down to the ground electronic state. Two different types of vibrational excitation of the C$_3$ fragments have been found: pure C$_3$-bending and antisymmetric C-C stretching. The branching ratios of the C$_3$ product states, the C$_3$-Ar vdW binding energy, and propensity rules for vibrational predissociation processes will be presented.