

## LIFETIMES OF THE $\tilde{A}$ STATES OF THE C<sub>3</sub>-NE AND C<sub>3</sub>-AR COMPLEXES

YI-JEN WANG, CHIAO-WEI CHEN, ANTHONY J. MERER, YEN-CHU HSU, *Institute of Atomic and Molecular Sciences, Academia Sinica, P. O. Box 23-166, Taipei 10617, Taiwan, R. O. C.*

Under similar experimental conditions to our previous paper, the fluorescence lifetimes of the  $\tilde{A}$  states of C<sub>3</sub>-Ne and C<sub>3</sub>-Ar have been determined. The uncertainties in the measured lifetimes are estimated to be better than 10%. About 50 perpendicular bands and 11 parallel bands of the  $\tilde{A} - \tilde{X}$  system of C<sub>3</sub> were used to probe the fluorescence lifetimes of the Ne and Ar complexes. It is not possible to reduce the backing pressure while measuring lifetimes of the complexes; we therefore reduced the average pressure of the chamber to  $1-2 \times 10^{-5}$  torr by lowering the repetition rate. No sign of predissociation was found in either complex. Transitions to high vibrational levels of the  $\tilde{A}$  state of C<sub>3</sub>, above  $4500 \text{ cm}^{-1}$ , give weak laser-induced fluorescence signals, so that lifetime measurements are not possible for some of these bands. The lifetimes of the levels of the Ne complex lying below  $4300 \text{ cm}^{-1}$  are generally shorter than 300 ns, except for some levels with C-C stretch excitation. The lifetimes of the Ne complex behave quite similarly to those of C<sub>3</sub>. In contrast, the lifetimes of the Ar complex do not follow the vibrational dependence of the lifetimes of C<sub>3</sub> and C<sub>3</sub>-Ne. We speculate that the complicated lifetime pattern observed in the Ar complex can be attributed to interactions with nearby triplet levels.