EVIDENCE FOR RADIATIONAL TRANSITIONS IN THE TRIPLET MANIFOLD OF SOME AROMATIC MOLECULES

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Pump-probe delayed ionization studies on benzonitrile and phenylacetylene in a supersonic beam have shown evidence of very long-lived excited states lasting more than hundreds of microseconds. Measurements of the ionization thresholds of these states are consistent with their being low vibrational levels of the lowest triplet states. Excitation of the molecules was done with a frequency-doubled, Fourier transform-limited pulse-amplified c.w. laser, and the rotationally resolved structure of the $S_1 - S_0$ transition ensures that the excited molecules are monomers. Lacking a dissociative mechanism for energy loss in the triplet manifold of the isolated molecules, it is inferred that the lower triplet states are being populated by photon emission, possibly between triplet electronic states.

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