Excitation of both the $2^1E^e \leftarrow 1^1A_2^e$ transition of $Na_3$ and the $1^1A_2^e \leftarrow 1^4A_2^e$ transition of $K_3$ lead to curve-crossings into a predissociative doublet state as evidenced by the presence of atomic ($P \rightarrow S$) and singlet dimer $B \rightarrow X$ fluorescing products. Single photon counting techniques have been employed to measure the intersystem crossing times in these simple systems by measuring the onset times of product fluorescence as a function of the vibrational state of the upper quartet state. We find that the spin-orbit mediated intersystem crossing occurs as expected more rapidly for $K_3$ than for $Na_3$ while, for the latter system, the rapidity of the process increases as we move to higher vibronically excited states.