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Temperature Dependent Studies of Negative Ion Lifetimes[1] M. CANNON, Y. LIU, L. SUESS, F.B. DUNNING, Rice University, J. STEILL, R.N. COMPTON, University of Tennessee — The lifetimes of SF_6^- ions produced in K(np)/SF_6 collisions at high n are being investigated as a function of target temperature over the range 300K to 600K. At room temperature, collisions are found to lead predominantly to the formation of long-lived SF_6^- ions with lifetimes τ >1ms. As the target temperature is raised long-lived (τ >0.5ms) ions are still observed but their mean lifetime is reduced. In addition, the growth of a short-lived ion signal (τ <10 μs) is evident which, by 600K, accounts for ∼45% of the total SF_6^- ion signal. These lifetimes are compared with those obtained using quasi-equilibrium theory and calculated SF_6^- vibrational frequencies. Measurement and theory are being extended to other attaching targets to further examine the factors that govern negative ion lifetimes.

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