Temperature Dependent Studies of Ion Lifetimes\textsuperscript{1} M. CANNON, Y. LIU, L. SUESS, F.B. DUNNING, Rice University — The lifetimes of SF\textsubscript{6} ions produced in K(np)/SF\textsubscript{6} collisions at high \(n\), \(n \geq 30\) are being investigated over a temperature range of 300K $\sim$ 600K. At room temperature, it is observed that collisions lead predominantly to the formation of long-lived (\(\tau \geq 1\)ms) SF\textsubscript{6}\textsuperscript{-} ions. The mean ion lifetime, however, decreases as the target gas temperature is increased and the data provide evidence of creation of short-lived ions having a range of lifetimes that extends below one microsecond. Such behavior is consistent with simple statistical theory. Limited SF\textsubscript{5}\textsuperscript{-} production is also observed at the higher temperatures. Measurements are being extended to a range of other attaching targets to further examine the role of internal energy in governing electron capture processes.

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