

Abstract Submitted  
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**Temperature Dependent Studies of Ion Lifetimes**<sup>1</sup> M. CANNON,  
Y. LIU, L. SUESS, F.B. DUNNING, Rice University — The lifetimes of  $\text{SF}_6^-$  ions  
produced in  $\text{K}(\text{np})/\text{SF}_6$  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 colli-  
sions lead predominantly to the formation of long-lived ( $\tau \geq 1\text{ms}$ )  $\text{SF}_6^-$  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 statis-  
tical theory. Limited  $\text{SF}_5^-$  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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