

Abstract Submitted  
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**Electron attachment to halogenated alkenes and alkanes, 300-600 K**<sup>1</sup> THOMAS M. MILLER, JEFFREY F. FRIEDMAN, NICHOLAS S. SHUMAN, ALBERT A. VIGGIANO, Air Force Research Laboratory — Rate coefficients ( $k_a$ ) and ion product distributions have been measured for 14 alkenes and alkanes with bromine, fluorine, and iodine substituents over the temperature range  $T = 300-600$  K using a flowing-afterglow Langmuir-probe apparatus (FALP), most for the first time. Among these are 3 isomers of  $C_3F_5Br$  and 2 isomers of  $C_3F_7I$ . Four dibromide compounds yield  $Br_2^-$  in addition to  $Br^-$ . The results follow the expected trends:  $k_a$  values near the capture limit decrease slightly with  $T$  according to Vogt-Wannier theory, while  $k_a$  increase with  $T$  for molecules which have small  $k_a$  at 300 K. The results are analyzed using a statistical kinetic modeling approach, which is able to reproduce  $k_a$  values and product branching within experimental uncertainty. The modeling indicates that factor of 2 differences in  $k_a$  for the isomeric species can be explained by subtle variations in the potential surfaces.

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