Abstract Submitted
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Dissociative attachment and vibrational excitation in low-energy electron-CF_3I collisions[1] I. FABRIKANT, University of Nebraska, S. MARIENFELD, M. BRAUN, M. RUF, H. HOTOP, University of Kaiserslautern — Trifluoroiodomethane (CF_3I) is a plasma etching gas that provides CF_3 radicals and I^- anions through an efficient dissociative electron attachment (DEA) process at near zero electron energies.[1] We have carried out a combined experimental and theoretical study of DEA to CF_3I at electron energies below 1 eV. Measurements, performed at high resolution with two variants of the laser photoelectron attachment method,[2] yielded a joint DEA cross section over the range 1-500 meV, normalized in absolute size to the thermal DEA rate coefficient from swarm data.[1] At the onsets for excitation of one and two quanta for the C-I stretching mode ν_3, clear downward cusps are detected. Calculations were performed by using the resonance R-matrix theory and the result for the thermal DEA rate coefficient.[1] The calculated DEA cross section shows good overall agreement with the experimental result in both shape and absolute size. In addition, we present theoretical cross sections for vibrational excitation of the ν_3 mode which exhibit strong threshold peaks. [1] L. G. Christophorou, J. K. Olthoff, J. Phys. Chem. Ref. Data **29**, 553 (2000). [2] H. Hotop, M.-W. Ruf, M. Allan, I. I. Fabrikant, Adv. At. Mol. Opt. Phys. **49**, 85 (2003).

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