Abstract Submitted
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Endothermic electron attachment to N_2O.[1] THOMAS M. MILLER, Boston College, JORDAN C. SAWYER, Ratheon Technologies, BRENDAN C. SWEENY, National Research Council, SHAUN G. ARD, ALBERT A. VIGGIANO, NICHOLAS S. SHUMAN, Air Force Research Laboratory — Rate constants for dissociative electron attachment (DEA) to N_2O yielding O^- have been measured as a function of temperature from 400-1000 K. In the 400-600 K range, upper limits are given. The data from 700 -1000 K follow Arrhenius behavior described by 2.4 x 10^{-8} exp(-0.29 eV / kT) cm^3 s^{-1}. The activation energy derived from the Arrhenius plot is equal to the endothermicity of the reaction. However, calculations at the CCSD(T)/CBS level suggest the lowest energy crossing between the neutral (linear) and anion (bent) surfaces lies 0.6 eV above the N_2O equilibrium geometry, 0.3 eV above the endothermicity of the DEA. Kinetic modeling under this assumption is in modest agreement with the experimental data. The data are best explained by DEA occurring below the lowest energy crossing of the neutral and valence anion surfaces via vibrational Feshbach resonances. The latter were earlier observed directly by Allan and Skallcký (J. Phys. B. **36**, 3397, 2003).

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