**Assessing the Atmospheric Impact of $CF_3CClH_2$ (HCFC-133a): Laboratory Measurements of OH Kinetics and UV and Infrared Absorption Spectra**

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$CF_3CClH_2$ (HCFC-133a or monochlorotrifluoroethane) was recently detected in the atmosphere and its atmospheric mixing ratio has quadrupled over the last 10 years. As expected for this class of compound, HCFC-133a is both an ozone-depleting substance and a greenhouse gas. Precise knowledge of its atmospheric degradation and radiative efficiency is critical to understanding its effect upon the atmosphere. The predominant atmospheric loss process for HCFC-133a is reaction with the hydroxyl radical (OH), where the rate coefficient for this reaction is poorly constrained, especially below room temperature. UV photolysis is a minor loss process, although large discrepancies exist in the literature. The primary focus of this work was to reduce the uncertainties in the atmospheric loss processes of HCFC-133a and its radiative efficiency. Rate coefficient measurements for the OH + HCFC-133a reaction over the temperature range 233–397 K will be reported. In addition, UV absorption spectrum measurements over the wavelength (184.95–240 nm) and temperature (213–323 K) ranges and infrared absorption measurements from 500–4000 cm-1 will be reported. These results are used in 2-D atmospheric model calculations to quantify the atmospheric loss processes, atmospheric lifetime, ozone depletion potential, radiative efficiency, and global warming potential of HCFC-133a. These important metrics will enable informed policy decisions regarding HCFC-133a.

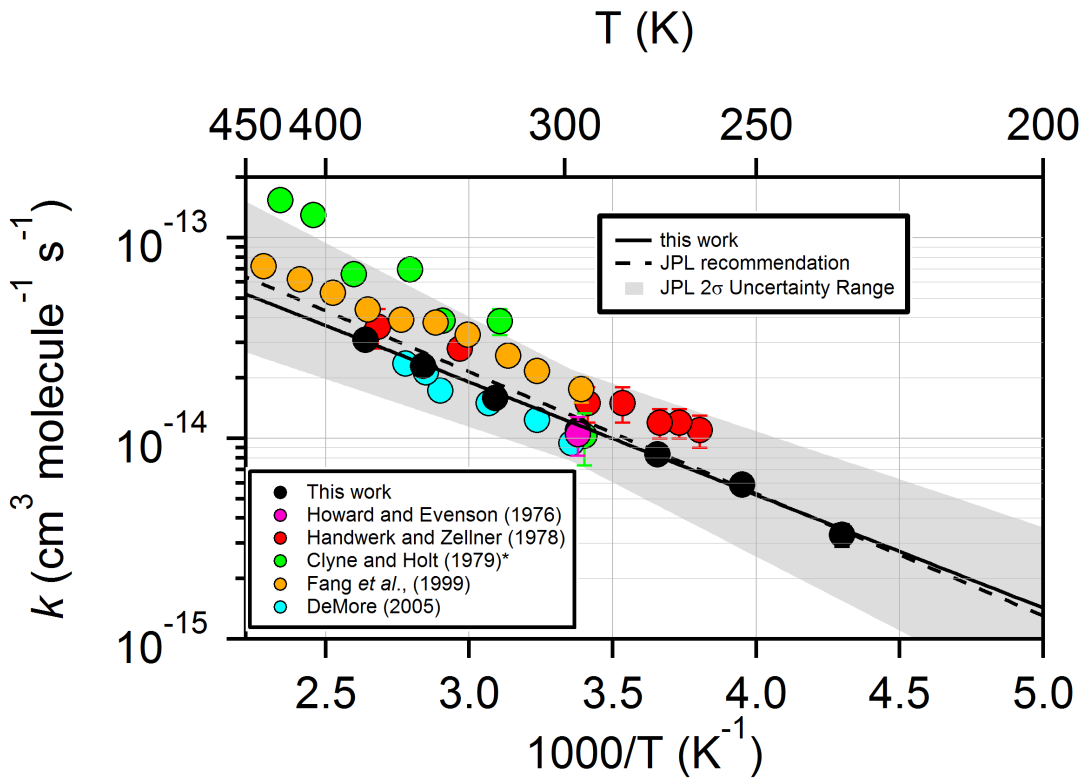


**Figure 1.** HCFC-133a + OH Arrhenius diagram.