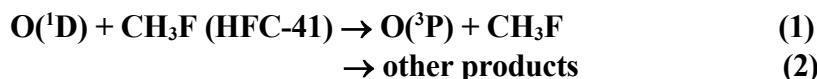


# IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation – Data Sheet of FOx2

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This datasheet last evaluated: June 2015; last change in preferred values: June 2003.



$$\Delta H^\circ(1) = -190 \text{ kJ mol}^{-1}$$

## Rate coefficient data ( $k = k_1 + k_2$ )

$k/\text{cm}^3 \text{ molecule}^{-1} \text{ s}^{-1}$	Temp./K	Reference	Technique/ Comments
<i>Absolute Rate Coefficients</i>			
$(1.38 \pm 0.06) \times 10^{-10}$	298	Force and Wiesenfeld, 1981	PLP-RA
$(1.65 \pm 0.15) \times 10^{-10}$	298	Schmoltner et al., 1993	PLP-RF
<i>Branching Ratios</i>			
$k_1/k = 0.25 \pm 0.03$	298	Force and Wiesenfeld, 1981	PLP-RA (a)
$k_1/k = 0.11 \pm 0.05$	298	Schmoltner et al., 1993	PLP-RF (b)
$k_1/k = 0.19 \pm 0.05$	298	Takahashi et al., 1996	PLP-LIF (b)

## Comments

- O(<sup>1</sup>D) atoms were monitored by resonance absorption at 130.4 nm and compared to O(<sup>3</sup>P) atoms in the presence of ozone in He diluent where the O(<sup>3</sup>P) atom yield from the O(<sup>1</sup>D) + O<sub>3</sub> reaction is 1.0.
- Branching ratio was determined from the ratio of the O(<sup>3</sup>P) yield from O(<sup>1</sup>D) + CH<sub>3</sub>F relative to that for O(<sup>1</sup>D) + N<sub>2</sub>.

## Preferred Values

$$k = 1.5 \times 10^{-10} \text{ cm}^3 \text{ molecule}^{-1} \text{ s}^{-1} \text{ at } 298 \text{ K.}$$

$$k_1/k = 0.18 \text{ at } 298 \text{ K.}$$

## Reliability

$$\Delta \log k = \pm 0.15 \text{ at } 298 \text{ K.}$$

$$\Delta(k_1/k) = \pm 0.1 \text{ at } 298 \text{ K.}$$

## Comments on Preferred Values

The preferred value of  $k$  is the average of the values reported by Force and Wiesenfeld (1981) and by Schmoltner et al. (1993). The preferred value of the branching ratio  $k_1/k$  is the average of the values reported by Force and Wiesenfeld (1981), by Schmoltner et al. (1993) and by Takahashi et al. (1996). In these experiments, only O(<sup>3</sup>P) was monitored and therefore no direct information relating to the products of the chemical reaction of O(<sup>1</sup>D) + CH<sub>3</sub>F was obtained. Burks and Lin (1981) have observed the appearance of stimulated emissions from vibrationally

excited HF. Park and Wiesenfeld (1991) observed some production of HO, but they reported that HF elimination dominates over HO production.

### References

- Burks, T. L. and Lin, M. C.: *Int. J. Chem. Kinet.*, 13, 977, 1981.  
Force, A. P. and Wiesenfeld, J. R.: *J. Phys. Chem.*, 85, 782, 1981.  
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Schmoltner, A. M., Talukdar, R. K., Warren, R. F., Mellouki, A., Goldfarb, L., Gierczak, T., McKeen, S. A. and Ravishankara, A. R.: *J. Phys. Chem.*, 97, 8976, 1993.  
Takahashi, K., Wada, R., Matsumi, Y. and Kawasaki, M.: *J. Phys. Chem.*, 100, 10145, 1996.