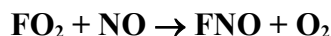


## IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation – Data Sheet iFOx14

Website: <http://iupac.pole-ether.fr>. See website for latest evaluated data. Data sheets can be downloaded for personal use only and must not be re-transmitted or disseminated either electronically or in hard copy without explicit written permission.

This data sheet updated: 22<sup>th</sup> July 2003.



$$\Delta H^\circ = -182 \text{ kJ}\cdot\text{mol}^{-1}$$

### Rate coefficient data

$k/\text{cm}^3 \text{ molecule}^{-1} \text{ s}^{-1}$	Temp./K	Reference	Technique/ Comments
<i>Absolute Rate Coefficients</i>			
$(1.5 \pm 0.1) \times 10^{-12}$	298	Sehested <i>et al.</i> , 1994 <sup>1</sup>	PR-UVA (a)
$7.5 \times 10^{-12} \exp[-(688 \pm 377)/T]$	190-298	Li, Friedl, and Sander, 1995 <sup>2</sup>	DF-MS (b)
$(8.5 \pm 1.3) \times 10^{-13}$	298		

### Comments

- Pulse radiolysis of NO-O<sub>2</sub>-SF<sub>6</sub> mixtures at 1 bar SF<sub>6</sub>. The formation of FNO was monitored in absorption at 310.5 nm. The yield of FNO was determined to be (100 ± 14)%.
- First-order decay rates of FO<sub>2</sub> in the presence of excess NO were monitored by mass spectrometry at a total pressure of 1.3 mbar He. The yield of FNO was found to be nearly 100%.

### Preferred Values

$$k = 7.5 \times 10^{-13} \text{ cm}^3 \text{ molecule}^{-1} \text{ s}^{-1} \text{ at } 298 \text{ K.}$$

$$k = 7.5 \times 10^{-12} \exp(-690/T) \text{ cm}^3 \text{ molecule}^{-1} \text{ s}^{-1} \text{ over the temperature range } 190 \text{ K to } 300 \text{ K.}$$

#### Reliability

$$\Delta \log k = \pm 0.3 \text{ at } 298 \text{ K.}$$

$$\Delta(E/R) = \pm 400 \text{ K.}$$

#### Comments on Preferred Values

The preferred values are based on results of the temperature-dependent study of Li *et al.*<sup>2</sup> The higher room temperature rate coefficient of Sehested *et al.*<sup>1</sup> is encompassed within the assigned uncertainty limits. The low barrier to form FNO may indicate that the reaction proceeds via formation of a short lived FOONO complex.<sup>3</sup>

## References

- <sup>1</sup> J. Sehested, K. Sehested, O. J. Nielsen, and T. J. Wallington, *J. Phys. Chem.* **98**, 6731 (1994).
- <sup>2</sup> Z. Li, R. R. Friedl, and S. P. Sander, *J. Phys. Chem.* **99**, 13445 (1995).
- <sup>3</sup> T. S. Dibble and J. S. Francisco, *J. Am Chem. Soc.* **119**, 2894 (1997).