$CCl_3O_2 + NO_2 + M \rightarrow CCl_3O_2NO_2 + M$

$\Delta H° = -105.6$ kJ mol^{-1}

Low-pressure rate coefficients
Rate coefficient data

k_0/cm^3 molecule^{-1} s^{-1}	Temp./K	Reference	Technique/ Comments
Absolute Rate Coefficients $(9.2 \pm 3) \times 10^{-29} (T/298)^{-6.0}$ [O_2]	233-373	Caralp et al., 1988	PLP-MS (a)

Comments

(a) Pulsed laser photolysis-MS study at pressures of 1.3-13 mbar. Falloff extrapolation with $F_c = \exp(-T/260)$, i. e. $F_c = 0.32$ at 298 K, and $k_\infty = 1.49 \times 10^{-12} (T/298)^{-0.3}$ cm^3 molecule^{-1} s^{-1}.

Preferred Values

$k_0 = 9.2 \times 10^{-29} (T/298)^{-6.0}$ [N_2] cm^3 molecule^{-1} s^{-1} over the temperature range 230-380 K.

Reliability

$\Delta \log k_0 = \pm 0.3$ at 298 K.
$\Delta n = \pm 2$.

Comments on Preferred Values

There is a single experimental study only. However, according to the analysis by Destriau and Troe (1990) it falls in line with related reactions. Equal values for k_0 are assumed for the bath gases O_2 and N_2. The F_c value should be used independent of the temperature.

High-pressure rate coefficients
Rate coefficient data

k_∞/cm^3 molecule^{-1} s^{-1}	Temp./K	Reference	Technique/ Comments
Absolute Rate Coefficients $(1.49 \pm 0.8) \times 10^{-12} (T/298)^{-0.3}$	233-373	Caralp et al., 1988	PLP-MS (a)

Comments

(a) See comment (a) for k_0.

Preferred Values

k_∞ =1.5 x 10^{-12} $(T/298)^{-0.7}$ cm^3 $molecule^{-1}$ s^{-1} over the temperature range 230-380 K.

Reliability

$\Delta \log k_\infty = \pm 0.3$ at 298 K.

$\Delta n = \pm 0.5$.

Comments on Preferred Values

See Comments on Preferred Values for k_0. Recommending a temperature-independent $F_c = 0.32$ is consistent with changing n from -0.3 to -0.7 such as preferred for related reactions.

References

Caralp, F., Lesclaux, R., Rayez, M.-T., Rayez, J.-C. and Forst, W.: J. Chem. Soc. Faraday Trans. 2, 84, 569, 1988.

Destriau, M. and Troe, J.: Int. J. Chem. Kinet., 22, 915, 1990.