# IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation – Data Sheet PCl26



The citation for this data sheet is: Atkinson, R., Baulch, D. L., Cox, R. A., Crowley, J. N., Hampson, R. F., Hynes, R. G., Jenkin, M. E., Rossi, M. J., Troe, J., and Wallington, T. J.: Atmos. Chem. Phys., 9, 4141, 2008; IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation, http://iupac.pole-ether.fr.

This datasheet last evaluated: June 2015; last change in preferred values: December 2005.

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**$CF_3CF_2CHCl_2$ (HCFC-225ca) + hν → products**

**Primary photochemical processes**

| Reaction | ΔH°/kJ·mol$^{-1}$ | $\lambda_{threshold}$/nm |
|---|---|---|
| $CF_3CF_2CHCl_2 + h\nu \rightarrow CF_3CF_2CHCl + Cl$ | 335 (est) | 360 |

**Preferred Values**

**Absorption cross-sections for $CF_3CF_2CHCl_2$ at 298 K**

| λ/nm | $10^{20}$ σ/cm$^2$ | λ/nm | $10^{20}$ σ/cm$^2$ |
|---|---|---|---|
| 160 | 269 | 200 | 16 |
| 165 | 197 | 205 | 6.9 |
| 170 | 183 | 210 | 2.9 |
| 175 | 191 | 215 | 1.2 |
| 180 | 177 | 220 | 0.46 |
| 185 | 129 | 225 | 0.17 |
| 190 | 74 | 230 | 0.065 |
| 195 | 37 | 240 | 0.011 |

*Comments on Preferred Values*

The preferred values of the absorption cross-sections at 298 K are the values reported by Braun et al. (1991). In the same study, absorption cross-section measurements in the liquid phase were made over the wavelength range 205-270 nm. Correction factors were used to convert these liquid-phase values into gas-phase values. The combined set of gas-phase values for the wavelength range 170-270 nm were fitted with the expression:

$$\log_{10}\sigma = -17.966 + 4.542 \times 10^{-2} X - 2.036 \times 10^{-3} X^2 + 1.042 \times 10^{-5} X^3 \text{ where } X = (\lambda - 160 \text{ nm})$$

Photolysis is expected to occur with unit quantum efficiency by breaking of the C-Cl bond to yield $CF_3CF_2CHCl + Cl$.

**Reference**

Braun,W., Fahr, A., Klein, R., Kurylo, M.J. and Huie, R.E.: J. Geophys. Res., 96, 13009, 1991.