

IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation – Data Sheet PCI25

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

CF₃CF₂Cl (CFC-115) + hv → products

Primary photochemical processes

Reaction	$\Delta H^\circ/\text{kJ}\cdot\text{mol}^{-1}$	$\lambda_{\text{threshold}}/\text{nm}$
CF ₃ CF ₂ Cl + hv → CF ₃ CF ₂ + Cl	346	346

Preferred Values

Absorption cross-sections for CF₃CF₂Cl at 295 K to 225 K

λ/nm	$10^{20} \sigma/\text{cm}^2$	λ/nm	$10^{20} \sigma/\text{cm}^2$
172	5.65	190	0.27
174	4.05	192	0.19
176	2.85	194	0.13
178	2.05	196	0.090
180	1.45	198	0.063
182	1.05	200	0.044
184	0.75	202	0.031
186	0.53	204	0.021
188	0.38		

Comments on Preferred Values

The preferred values of the absorption cross-sections are those reported by Simon et al. (1988). In this study measurements were made down to 225 K, and the absorption cross-section values were found to be independent of temperature. They are in good agreement with the results of

Hubrich and Stuhl (1980), who also made low temperature measurements. Earlier measurements of Chou et al. (1978) are 50% higher. Photolysis is expected to occur with unit quantum efficiency by breaking of the C-Cl bond to yield $\text{CF}_3\text{CF}_2 + \text{Cl}$.

References

- Chou, C. C., Milstein, R. J., Smith, W. S., Vera Ruiz, H., Molina, M. J. and Rowland, F. S.: J. Phys. Chem. 82, 1, 1978.
- Hubrich, C. and Stuhl, F.: J. Photochem. 12, 93, 1980.
- Simon, P. C., Gillotay, D., Vanlaethem-Meuree, N. and Wisenberg, J.: Ann. Geophysicae 6, 239, 1988.