

## IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation – Data Sheet PCI23

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

### CF<sub>2</sub>ClCFCl<sub>2</sub> (CFC-113) + hv → products

#### Primary photochemical processes

Reaction	$\Delta H^\circ/\text{kJ}\cdot\text{mol}^{-1}$	$\lambda_{\text{threshold}}/\text{nm}$
CF <sub>2</sub> ClCFCl <sub>2</sub> + hv → CF <sub>2</sub> ClCFCl + Cl (1)	346 (est)	346
→ CFC <sub>2</sub> CF <sub>2</sub> + Cl (2)	346 (est)	346

#### Preferred Values

##### Absorption cross-sections for CF<sub>2</sub>ClCFCl<sub>2</sub> at 295 K and 210 K

$\lambda/\text{nm}$	$10^{20} \sigma/\text{cm}^2$		$\lambda/\text{nm}$	$10^{20} \sigma/\text{cm}^2$	
	295K	210 K		295 K	210 K
184	118	a	210	1.80	1.12
186	104	a	212	1.15	0.696
188	83.5	a	214	0.760	0.452
190	64.5	a	216	0.505	0.298
192	48.8	a	218	0.318	0.184
194	36.0	a	220	0.220	0.125
196	26.0	24.3	222	0.145	0.081
198	18.3	15.9	224	0.095	0.053
200	12.5	10.1	226	0.063	0.034
202	8.60	6.54	228	0.041	0.022
204	5.80	4.09	230	0.027	0.014
206	4.00	2.66			
208	2.65	1.68			

(a) No temperature dependence observed.

### *Comments on Preferred Values*

The preferred values of the absorption cross-sections are those reported by Simon et al. (1988). They are in good agreement with the room temperature results of Chou et al. (1978) and Hubrich and Stuhl (1980), who also made low temperature measurements. Photolysis is expected to occur with unit quantum efficiency by breaking of the C-Cl bond to yield  $\text{CF}_2\text{ClCFCl} + \text{Cl}$  or  $\text{CFCl}_2\text{CF}_2 + \text{Cl}$ .

### **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.