

IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation – Data Sheet PC11

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 retransmitted or disseminated either electronically or in hardcopy without explicit written permission.

This data sheet updated: 20th July 2006.

HCl + hv → products

Primary photochemical processes

Reaction	$\Delta H^\circ/\text{kJ}\cdot\text{mol}^{-1}$	$\lambda_{\text{threshold}}/\text{nm}$
HCl + hv → H + Cl	432	277

Preferred Values

Absorption cross-sections for HCl at 298 K

λ/nm	$10^{20} \sigma/\text{cm}^2$	λ/nm	$10^{20} \sigma/\text{cm}^2$	λ/nm	$10^{20} \sigma/\text{cm}^2$
135	123	162.5	273	190	13.8
137.5	152	165	240	195	5.96
140	205	167.5	199	200	2.39
142.5	238	170	163	205	0.903
145	279	172.5	136	210	0.310
147.5	311	175	106	215	0.101
150	334	177.5	79.6	220	0.030
152.5	342	180	58.9	225	0.010
155	343	182.5	42.3	230	0.0034
157.5	327	185	29.4		
160	306	187.5	20.3		

Comments on Preferred Values

The preferred values of the absorption cross-sections at 298 K are those reported by Bahou et al., (2001) and Cheng et al. (2002). These are in good agreement with previous spectra from Nee et al. (1986) and Inn et al. (1975). The tabulated values of the cross sections are 2.5 or 5 nm averages of the 0.1 nm resolution data reported in Bahou et al. (2001), and evaluated by the NASA-JPL panel (Sander et al., 2006).

Photolysis is expected to occur with unit quantum efficiency, with some wavelength dependence in the branching ratio to ground and excited state Cl atoms. See Sander et al. (2006), and references therein for details.

References

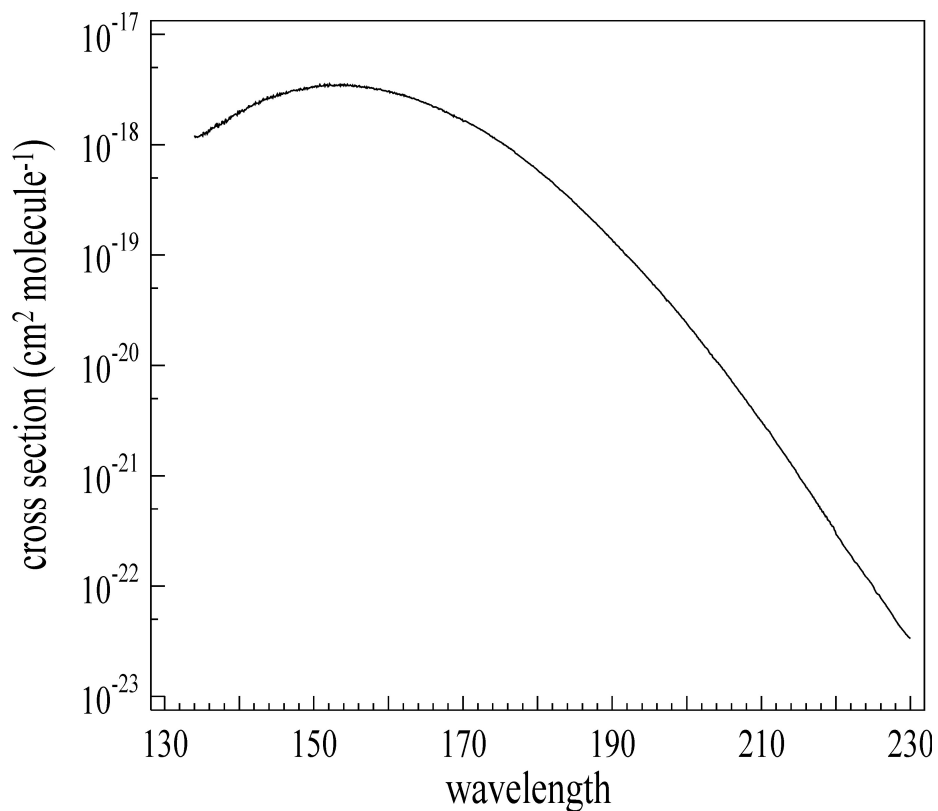
Bahou, M., Chung, C. Y., Lee, Y. P., Cheng, B. M., Yung, Y. L., and Lee, L. C.: *Astrophys. J.* 559, L179-L182, 2001.

Cheng, B. M., Chung, C. Y., Bahou, M., Lee, Y. P., and Lee, L. C.: *J. Chem. Phys.* 117, 4293-4298, 2002.

Inn, E. C. Y.: *J. Atmos. Sci.*, 32, 2375, 1975.

Nee, J. B., Suto, M., and Lee, L. C.: J. Chem. Phys. 85, 719-724, 1986.

Sander, S. P., Finlayson-Pitts, B. J., Friedl, R. R., Golden, D. M., Huie, Keller-Rudek, H., R. E., Kolb, C. E., Kurylo, M. J., Molina, M. J., Moortgat, G. K., Orkin, V. L., Ravishankara, A. R., and Wine, P. H.: "Chemical Kinetics and Photochemical Data for Use in Atmospheric Studies, Evaluation Number 15," JPL Publication 06-2, Jet Propulsion Laboratory, Pasadena, 2006.



Absorption cross sections of HCl at 298 K (0.1 nm resolution) as reported in Cheng et al. (2002).