

IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation – Data Sheet P11

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.

HI + hv → products

Primary photochemical processes

Reaction	$\Delta H^\circ/\text{kJ}\cdot\text{mol}^{-1}$	$\lambda_{\text{threshold}}/\text{nm}$
HI + hv → H + I	298	401

Preferred Values

Absorption cross-sections for HI at 298 K

λ/nm	$10^{20} \sigma/\text{cm}^2$	λ/nm	$10^{20} \sigma/\text{cm}^2$
200	61.0	275	12.4
205	67.7	280	8.94
210	73.8	285	6.37
215	78.4	290	4.51
220	80.8	295	3.17
225	80.4	300	2.23
230	77.4	305	1.52
235	71.9	310	1.01
240	64.6	315	0.653
245	56.1	320	0.409
250	47.0	325	0.247
255	38.1	330	0.145
260	30.0	335	0.083
265	23.0	340	0.047
270	17.2		

Quantum yield for HI photolysis

$$\phi = 1.0$$

Comments on Preferred Values

HI has a continuous absorption spectrum with an onset at about 327 nm. The preferred values are based on the measurements of Campuzano-Jost and Crowley (1999). These values are in good agreement with the cross sections reported by Huebert and Martin (1968) and Ogilvie (1971). Earlier measurements of absorption cross-sections were reported by Goodeve and Taylor (1935) and Romand (1949).

The primary photochemical process forms H and I atoms with a quantum yield of about unity at 185 and 254 nm (Martin and Williard, 1964). The branching ratio for production of $I(^2P_{1/2})$ and $I(^2P_{3/2})$ was measured in Langford et al. (1998) as a function of the wavelength between 190 and 305 nm.

References

Campuzano-Jost, P., and Crowley, J. N.: *J. Phys. Chem. A*, 103, 2712, 1999.

Goodeve, C. F., and Taylor, A. W. C.: *Proc. Roy. Soc. A*, 152, 221, 1935.

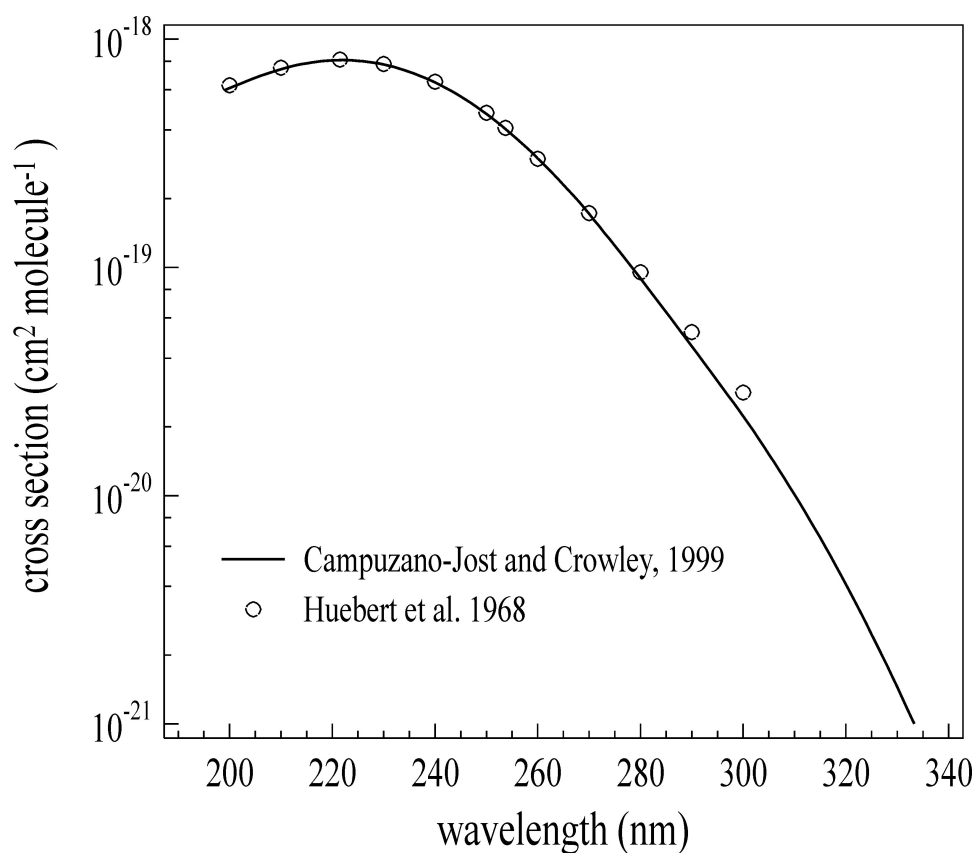
Huebert, B. J., and Martin, R. M.: *J. Phys. Chem.*, 72, 3046, 1968.

Langford, S. R., Regan, P. M., Orr-Ewing, A. J., and Ashfold, M. N. R.: *Chem. Phys.*, 231, 245, 1998.

Martin, R. M., and Williard, J. E.: *J. Chem. Phys.*, 40, 2999, 1964.

Ogilvie, J. F.: *Trans. Faraday Soc.*, 67, 2205, 1971.

Romand, J.: *Ann. Phys., Paris*, 4, 527, 1949.



Absorption cross sections of HI: The preferred values are those of Campuzano-Jost and Crowley, 1999.