IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation – Data Sheet PBr5

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cis-BrONO + hν → products

Primary photochemical processes

Reaction		$\Delta H°$/kJ·mol^{-1} *	$\lambda_{threshold}$/nm
$BrONO + h\nu \rightarrow Br + NO_2$	(1)	68	1759
$BrONO + h\nu \rightarrow BrO + NO$	(2)	133	899

*$\Delta H°_{298}$ (BrONO) = 77 kJ·mol^{-1} taken from Lee (1996).

Preferred Values

Absorption cross-sections for cis-BrONO at 228-296 K

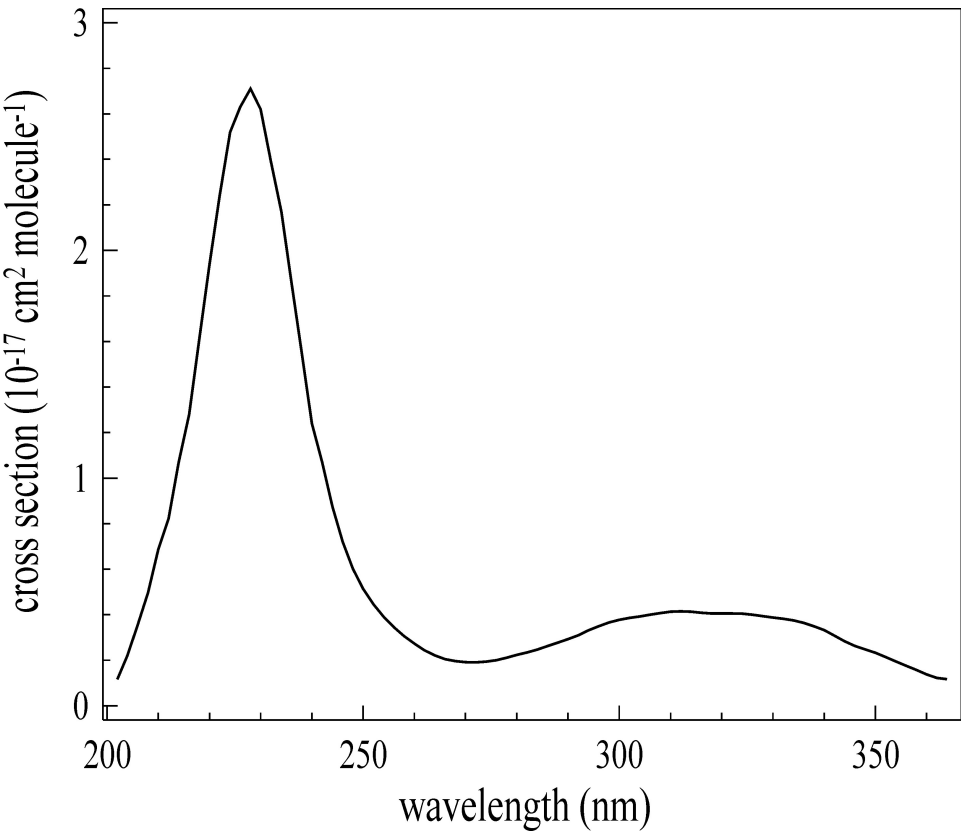
λ/nm	10^{20} σ/cm^2	λ/nm	10^{20} σ/cm^2
205	289	285	254
210	687	290	293
215	1172	295	341
220	1940	300	377
225	2588	305	396
230	2620	310	413
235	2022	315	411
240	1240	320	406
245	790	325	403
250	514	330	387
255	367	335	370
260	273	340	332
265	212	345	273
270	192	350	233
275	196	355	185
280	223	360	138

Comments on Preferred Values

The absorption spectrum of BrONO has been reported by Burkholder and Orlando (2000) who generated it (along with $BrNO_2$ and BrNO) photochemically. Following deconvolution of $BrNO_2$ and BrNO absorption the BrONO cross sections were calculated relative to $BrNO_2$. (Scheffler et al., 1997). Uncertainties of 36 % (200-210 nm), 25 % (210-250 nm) and 22 % (λ > 250 nm) are reported. No change in the spectral shape was observed between 228 and 296 K.
There are no experimental data on the primary photochemical processes for BrONO, both dissociation channels (1) and (2) are possible.

References

Burkholder, J. B., and Orlando, J. J.: Chem. Phys. Lett., 317, 603-608, 2000.
Lee, T. J.: J. Phys. Chem., 100, 19847-19852, 1996.
Scheffler, D., Grothe, H., Willner, A., Frenzel, A., and Zetzsch, C.: Inorg. Chem. 36, 335-338, 1997.



Absorption cross sections of BrONO: as reported by Burkholder and Orlando, (2000).