

# IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation – Data Sheet PCI7

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This data sheet updated: 20<sup>th</sup> July 2006.

## CINO + hv → products

### Primary photochemical processes

Reaction	$\Delta H^\circ/\text{kJ}\cdot\text{mol}^{-1}$	$\lambda_{\text{threshold}}/\text{nm}$
CINO + hv → Cl + NO	160	750

### Preferred Values

#### Absorption cross-sections for CINO at 298 K

$\lambda/\text{nm}$	$10^{20} \sigma/\text{cm}^2$	$\lambda/\text{nm}$	$10^{20} \sigma/\text{cm}^2$	$\lambda/\text{nm}$	$10^{20} \sigma/\text{cm}^2$	$\lambda/\text{nm}$	$10^{20} \sigma/\text{cm}^2$
190	4320	246	45.2	302	10.3	370	11.0
192	5340	248	37.7	304	10.5	375	9.95
194	6150	250	31.7	306	10.8	380	8.86
196	6480	252	27.4	308	11.1	385	7.82
198	6310	254	23.7	310	11.5	390	6.86
200	5860	256	21.3	312	11.9	395	5.97
202	5250	258	19.0	314	12.2	400	5.13
204	4540	260	17.5	316	12.5	405	4.40
206	3840	262	16.5	318	13.0	410	3.83
208	3210	264	15.3	320	13.4	415	3.38
210	2630	266	14.4	322	13.6	420	2.89
212	2180	268	13.6	324	14.0	425	2.45
214	1760	270	12.9	326	14.3	430	2.21
216	1400	272	12.3	328	14.6	435	2.20
218	1110	274	11.8	330	14.7	440	2.20
220	896	276	11.3	332	14.9	445	2.07
222	707	278	10.7	334	15.1	450	1.87
224	552	280	10.6	336	15.3	455	1.79
226	436	282	10.2	338	15.3	460	1.95
228	339	284	9.99	340	15.2	465	2.25
230	266	286	9.84	342	15.3	470	2.50
232	212	288	9.71	344	15.1	475	2.61
234	164	290	9.64	346	15.1	480	2.53
236	128	292	9.63	348	14.9	485	2.33
238	101	294	9.69	350	14.5	490	2.07
240	82.5	296	9.71	355	13.6	495	1.78
242	67.2	298	9.89	360	12.9	500	1.50

### Quantum yields for ClNO photolysis at 298 K

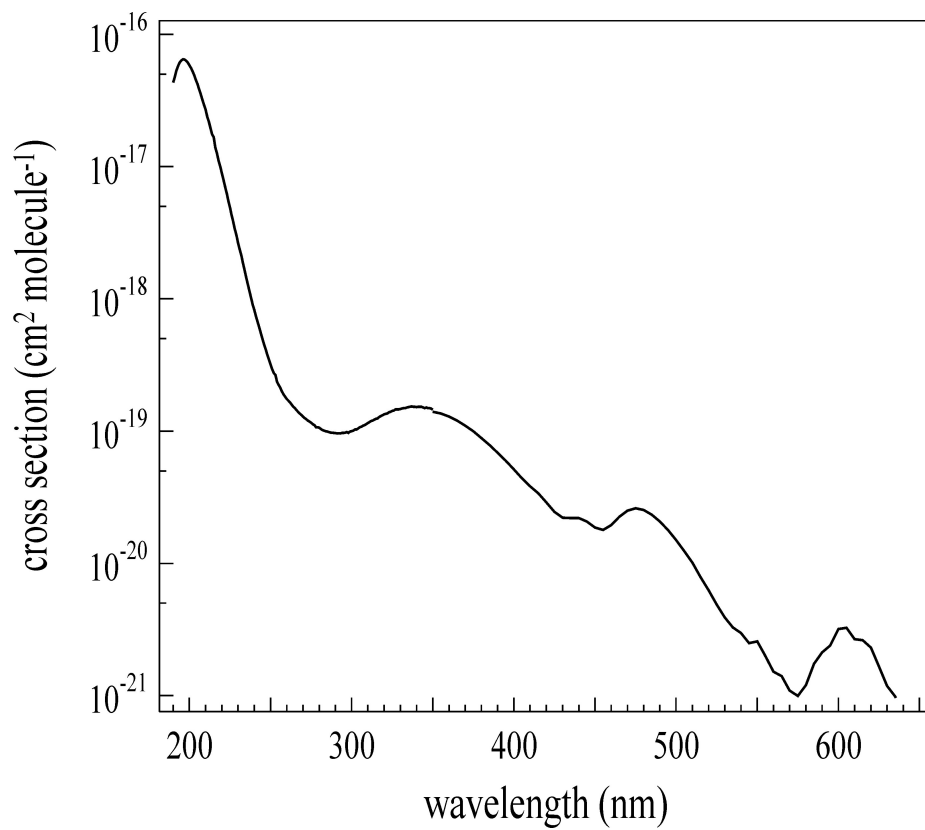
$\phi = 1.0$  over the entire wavelength range.

#### *Comments on Preferred Values*

The preferred values of the absorption cross sections at 298 K for the wavelength range 190-350 nm are the values reported by Tyndall et al. (1987) and for the longer wavelengths are the values reported in Roehl et al. (1992). Roehl et al. (1992) determined values over the wavelength range 350-650 nm and the temperature range 223-343 K. Earlier results are discussed by Sander et al., 2006. The preferred quantum yield values are taken from Calvert and Pitts 1966). Relative yields of the spin-orbit states of  $\text{Cl}(^2\Pi_{3/2})$  and  $\text{Cl}(^2\Pi_{1/2})$  have been measured by Felder and Morley (1999) and Skorobogatov et al. (1996).

#### References

- Calvert, J. G. and Pitts, Jr., J. N.: *Photochemistry*, John Wiley & Sons Inc., New York, p. 230, 1966.
- Felder, P. and Morley, G. P.: *Chem. Phys.*, 185, 145, 1999.
- Roehl, C. M., Orlando, J. J., and Calvert, J. G.: *J. Photochem. Photobiol. A: Chem.*, 69, 1, 1992.
- 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.
- Skorobogatov, V., Sato, Y., Suto, K., Matsumi, Y., and Kawasaki, M.: *J. Phys. Chem.*, 100, 12321, 1996.
- Tyndall, G. S., Stedman, K. M., Schneider, W., Burrows, J. P., and Moortgat, G. K.: *J. Photochem.*, 36, 133, 1987.



**Absorption cross sections of ClNO:** 190-350 nm data at 298 K from Tyndall et al. (1987). 350-650 nm data at 294 K from Roehl et al. (1992).