ThO Levels and Spectroscopy

F [$^1\Sigma$?*] (545/767)

G [95% $^3\Phi$] (555/787)

E [55% $^1\Sigma^+$, 35% $^3\Sigma^-$](613/908)

D [75% $^3\Sigma^+$, 15% $^3\Phi$](627/940)

C [75% $^1\Pi$, 20% $^3\Pi$] (690/1090)

B [75% $^3\Pi$, 20% $^1\Pi$](898/1720)

A [95% $^3\Pi$, 5% $^1\Sigma^+$](944/1892)

Q [95% $^3\Delta$, 5% $^1\Delta$] (1632/12326)

H [100% $^3\Delta$] (1880)

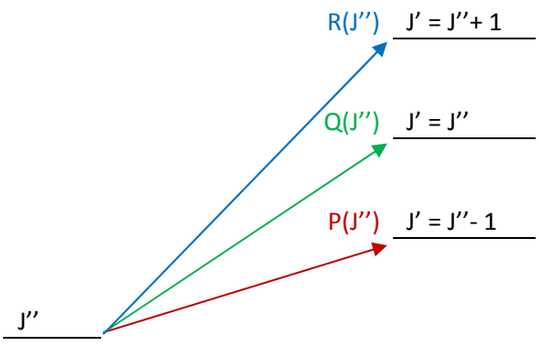
X [100% $^1\Sigma^+$]

Ω = 0^+ **Ω = 1** **Ω = 2**

[Square brackets] give ΛS states rounded to the nearest multiple of 5.
(Round brackets) give the wavelength in nm for the transition to the ground state/H state.

State	Ω	$^{2S+1}\Lambda$, three leading terms	T_0 [cm^{-1}]	ω_e [cm^{-1}]	B_e [cm^{-1}]†	r_e [Å]	μ_{elec} [D]
X	0	99.9% $^1\Sigma^+$	0	895.77	0.33326	1.840	3.9
H	1	98.4% $^3\Delta$, 1.1% $^3\Pi$, 0.5% $^1\Pi$	5316.60	857.2	0.32638	1.858	5.4
A	0	95.3% $^3\Pi$, 4.7% $^1\Sigma^+$	10600.82	846.4	0.32304	1.867	
B	1	76.5% $^3\Pi$, 17.8% $^1\Pi$, 5.2% $^3\Sigma^+$	11129.14	842.80	0.32497 0.32364	1.864	
C	1	76.6% $^1\Pi$, 19.5% $^3\Pi$, 1.5 $^3\Delta$	14490.02	825.1	0.32246 0.32162	1.870	
D	1	74.5% $^3\Sigma^+$, 14.6% $^3\Phi$, 6.5% $^1\Pi$	15946.22	839.2	0.32155 0.32569	1.866	
E	0	53.1% $^1\Sigma^+$, 35.1% $^3\Sigma^-$, 9.9% $^3\Phi$	16320.37	829.26	0.32309	1.867	
F	0	$^1\Sigma$?*	18337.56	757.36	0.32140	1.870	
G	2	94.9% $^3\Phi$, 3.0% $^1\Delta$, 2.0% $^3\Delta$	18009.93	809.1	0.31814	1.882	
Q	2	94.1% $^3\Delta$, 4.0% $^1\Delta$, 1.9% $^3\Pi$	6127.92	858.42	0.32703	1.856	

†When two values of B_e are shown, they correspond to the upper and lower Ω doublet components

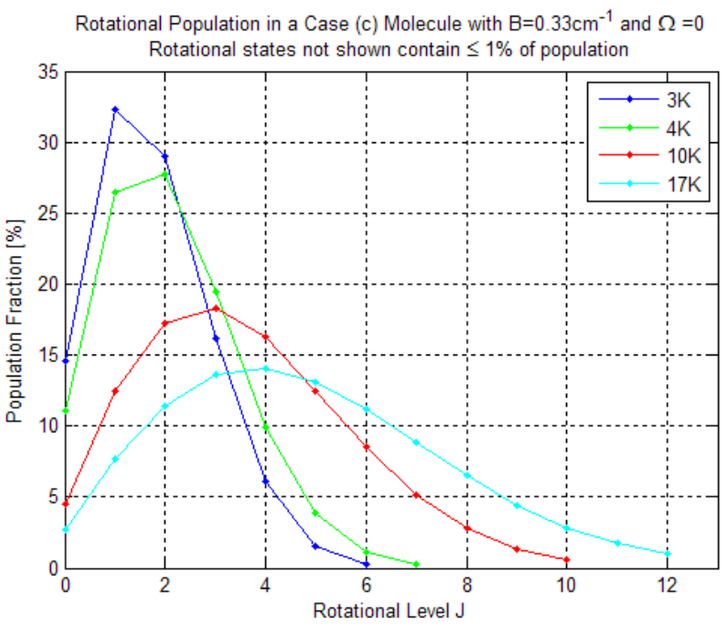


Other electronic transitions [nm]

	I	M	K	O	L	N
X	511	460	441	432	402	360
H	703	609	577	561	511	446?

X – C (690 nm)	
R(1)	14490.64
Q(1)	14489.98
Q(2)	14489.93
Q(3)	14489.86
Q(4)	14489.77
Q(5)	14489.67
Q(6)	14489.53
X – A (944 nm)	
P(1)	10600.15
P(2)	10599.47
P(3)	10598.77
R(1)	10601.47
R(2)	10602.09
R(3)	10602.70

H – E (908 nm)	
P(1)	11003.12
P(2)	11002.46
Q(1)	11003.76
Q(2)	11003.75
R(1)	11005.06
R(2)	11005.69
H – G (787 nm)	
R(1)	12694.58
R(2)	12695.18
R(3)	12695.78
R(4)	12696.34
Q(2)	12693.29
Q(3)	12693.24
P(3)	12691.34
P(4)	12690.63



References

Marian et al, Journal of Molecular Structure (Theochem), 169 (1988) 339-354

Paulovic et al, Journal of Chemical Physics, Volume 119 Number 2, (2003)

*Edvinsson et al, Ark. Fys. Band 30 nr. 22, 1965

Edvinsson et al, Journal of Molecular Spectroscopy 113, 93-104 (1985)