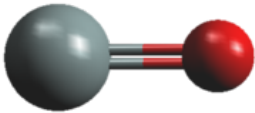


SiO, $\nu = 0 - 10$

Silicon monoxide, $\nu = 0 - 10$



Species tag	044505
Version	2*
Date of Entry	Jan. 2014
Contributor	H. S. P. Müller

The data set has been greatly extended with respect to the first entry from December 2000. The fit and the data set have been described in
(1) H. S. P. Müller, S. Spezzano, L. Bizzocchi, C. A. Gottlieb, C. Degli Esposti, and M. C. McCarthy, 2013, *J. Phys. Chem. A* **117**, 13843.
Additional rotational data were taken from
(2) M. E. Sanz, M. C. McCarthy, and P. Thaddeus, 2003, *J. Chem. Phys.*, **119**, 11715;
from
(3) R. Mollaaghababa, C. A. Gottlieb, J. M. Vrtilek, and P. Thaddeus, 1991, *Astrophys. J.* **368**, L19;
and from
(4) S.-H. Cho and S. Saito, 1998, *Astrophys. J.* **496**, L51.
Infrared transitions were also used in the fit. These were reported by
(5) F. J. Lovas, A. G. Maki, and W. B. Olson, 1981, *J. Mol. Spectrosc.* **87**, 449;
and by
(6) J. M. Campbell, D. Klapstein, M. Dulick, P. F. Bernath, and L. Wallace, 1995, *Astrophys. J. Suppl. Ser.* **101**, 237.
Predictions with uncertainties larger than 300 kHz should be viewed with some caution. They may, however, still be reasonable up to at least $J = 100$ because of the extensive IR data.
The partition function is fully converged up to 2000 K.
The equilibrium dipole moment and its first order vibrational correction was taken from
(7) J. W. Raymonda, J. S. Muentner, and W. A. Klemperer, 1970, *J. Chem. Phys.* **52**, 3458.
A first order rotational correction of 6.4 μ D was estimated from Einstein A values reported in
(8) E. J. Barton, S. N. Yurchenko, and J. Tennyson, 2013, *Mon. Not. R. Astron. Soc.* **434**, 1496.
This correction is negligible below 1 THz; it reaches the one percent level slightly below $J = 50$. The agreement between rotationless dipole moments derived from (7) and the values in (8) is very good; the equilibrium value in (8) is marginally smaller, the first order vibrational correction marginally smaller. The small deviations are compatible with the uncertainties in (7), uncertainties in (8) may also contribute. A higher order rotational correction to the dipole moment may show up in the $\nu = 0$ data, but is well below the one percent level throughout. The derived A values at higher ν are compatible with the rotational correction mentioned above; very small deviations appear to be somewhat irregular. Even though the reliability of the distortion correction to the dipole moment is difficult to judge, only slight caution is advised for the intensities of transitions with J above 100.

Lines Listed	1190
Frequency / GHz	< 5897
Max. J	144
log STR0	-30.0
log STR1	-30.0
Isotope Corr.	-0.0362
Egy / cm ⁻¹	0.0, 1229.6, 2447.3, ..., 11765.2
μ_a / D	3.0882 + 0.0197(ν +1/2)
μ_b / D	
μ_c / D	
A / MHz	
B / MHz	21787.487 – 151.039(ν +1/2)
C / MHz	
Q(2000.)	3318.6280
Q(1000.)	1162.9451
Q(500.0)	495.3216
Q(300.0)	289.2668
Q(225.0)	216.4742
Q(150.0)	144.3441
Q(75.00)	72.3246
Q(37.50)	36.3268
Q(18.75)	18.3320
Q(9.375)	9.3381
Q(5.000)	5.1463
Q(2.725)	2.9760
detected in ISM/CSM	yes ($\nu = 0 - 5$)

