Species Tag:	19004	Name:	H_3O^+
Version:	3		Hydronium ion,
Date:	Jan. 2010		GS, $\nu_2 = 1$
Contributor:	S. Yu		
	B. J. Drouin		
Lines Listed:	304	Q(300.0)=	520.1679
Freq. (GHz) <	10000	Q(225.0)=	326.8681
Max. J:	20	Q(150.0)=	174.0742
LOGSTR0=	-5.0	Q(75.00)=	62.5579
LOGSTR1=	-5.0	Q(37.50)=	26.6647
Isotope Corr.:	0.0	Q(18.75)=	15.9161
Egy. (cm^{-1}) >	0.0	Q(9.375)=	11.6139
μ_a =		A=	331411.77
μ_b =		B=	A
μ_c =	1.438	C=	186836.77

The two inversion states of the ground state, $\nu_1 = 1$, $\nu_2 = 1$, $\nu_3 = 1$, $\nu_4 = 1$ states are included in this calculation. The vibrational designations are as the following: 00 for 0^-; 01 for 0^+; 02 for ν_2^-, 03 for ν_2^+, 04 for ν_1^-, 05 for ν_1^+, 06 for ν_3^-, $l = 1$; 07 for ν_3^-, l = -1; 08 for ν_3^+, $l = 1$; 09 for ν_3^+, l = -1; 10 for ν_4^-, $l = 1$; 11 for ν_4^-, l = -1; 12 for ν_4^+, $l = 1$; 13 for ν_4^+, l = -1; The experimental measurements were reported by Plummer et al., 1985, J. Chem. Phys. **83**, 1428; Bogey et al., 1985, Astron. Astrophys. **148**, L11; Verhoeve et al., 1988, Chem. Phys. Lett., **143**, 501; Verhoeve et al., 1989, Chem. Phys. Lett., **161**, 195; Liu and Oka, 1985, Phys. Rev. Lett. **54**, 1787; Liu et al., 1985, J. Chem. Phys. **82**, 5368; Liu et al.,1986, J. Chem. Phys., **84**, 1312; Davies et al., 1985, J. Opt. Soc. Am. B, **2**, 794; Haese and Oka, 1984, J. Chem. Phys., **80** , 572; Lemoine and Destombes, 1984, Chem. Phys. Lett., **111**, 284; Zheng et al., 2007, Chin. Phys. Lett., **24**, 2569; Tang and Oka, 1999, J. Mol. Spectrosc., **196**, 120; Stahn et al., 1987, Mol. Phys. **60**, 121; Ho al., 1991, J. Mol. Spectrosc., **149**, 530; Begemann MH, Saykally RJ, J. Chem. Phys. **82**(8), 3570-3579, 1985; Gruebele et al., 1987 J. Chem. Phys., **87**, 3347; Stephenson SK, Saykally RJ, Chem. Rev. 105(9), 3220-3234, 2005; Uy D, White ET, Oka T, J. Mol. Spectrosc., 183(2), 240-244, 1997; Yu et al., 2008, Astrophys. J. Supp. 180(1), 119, 2009.

The dipole moments for the inversion transitions, ν_1 and ν_2 were taken from the results from Botschwina et al. 1984, Chem. Phys. Lett. **102**, 299; the dipole moments for ν_3 and ν_4 are not available and were estimated based on the available infrared intensity ratios (Colvin et al. 1983, J. Chem. Phys. **79**, 1551) with the assumption that infrared intensities are proportional to the square of dipole moments.