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| Species Tag: | 19004 | Name: | H ₃ O ⁺ |
| 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 |
| $\mu_a =$ | | A= | 331411.77 |
| $\mu_b =$ | | B= | A |
| $\mu_c =$ | 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 et 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.