

Species Tag:	29002	Name:	HCO+
Version:	4		Formyl cation /
Date:	Mar. 2007		Oxomethylum,
Contributor:	B. J. Drouin		X $^1\Sigma^+$
			$nu_2=0,1,2, nu_1=1, nu_3=1$
Lines Listed:	373	Q(300.0)=	145.9867
Freq. (GHz) <	3561	Q(225.0)=	106.5592
Max. J:	40	Q(150.0)=	70.4887
LOGSTR0=	-10.0	Q(75.00)=	35.3833
LOGSTR1=	-8.0	Q(37.50)=	17.8601
Isotope Corr.:	0.	Q(18.75)=	9.1023
Egy. (cm^{-1}) >	0.0	Q(9.375)=	4.7298
$\mu_a =$	3.888	A=	
$\mu_b =$		B=	44594.4
$\mu_c =$		C=	

The observed microwave lines are from R. C. Woods, T. A. Dixon, R. J. Saykally, and P. G. Szanto, 1975, *Phys. Rev. Lett.* **35**, 1269; K. V. L. N. Sastry, E. Herbst, and F. C. De Lucia, 1981, *J. Chem. Phys.* **75**, 4169; and F. C. van den Heuvel and A. Dymanus, 1982, *Chem. Phys. Lett.* **92**, 21, G. A. Blake, K. B. Laughlin, R. C. Cohen, K. L. Busarow and R. J. Saykally, 1987, *Astrophys. J.* **316**, L45; E. Hirota and Y. Endo, 1988, *J. Mol. Spectrosc.* **127**, 527, and V. Lattanzi, A. Walters, B. J. Drouin and J. C. Pearson, 2007, *Astrophys. J.* **662** 771-778, 2007. The observed infrared transitions were taken from P. B. Davies and W. J. Rothwell, 1984, *J. Chem. Phys.* **81**, 5239; K. Kawaguchi, C. Yamada, S. Saito and E. Hirota, 1985, *J. Chem. Phys.* **82**, 1750; P. B. Davies, P. A. Hamilton and W. J. Rothwell, 1984, *J. Chem. Phys.* **81**, 1598; S. C. Foster, A. R. W. McKeller and T. J. Sears, 1984, *J. Chem. Phys.* **81**, 578; C. S. Gudeman, M. H. Begemann, J. Pfaff and R. J. Saykally, 1983, *Phys. Rev. Lett.* **50**, 727; T. Amano, 1983, *J. Chem. Phys.* **79**, 3595; D.-J. Liu, S.-T. Lee and T. Oka, 1988, *J. Mol. Spectrosc.* **128**, 236.

The vibrational state are as follows: $v=0$ is the ground, $v=1$ is $nu_2=1$ (bend), $v=2$ is $nu_2=2$ $l=0$ (bend), $v=3$ is $nu_3=1$ (C-O stretch), and $v=4$ is $nu_1=1$ (C-H stretch). Only $l=0$ components for the $nu_2=2$ state have been reported. These were fit to an effective Hamiltonian as in E. Hirota and Y. Endo.

The dipole moment was estimated theoretically by Yamaguchi *et al.* 1994, *J. Chem. Phys.* **101**, 8945-8954 and was assumed for all the states.