Species Tag:	26002	Name:	$^{12}C_2H_2$
Version:	1		Acetylene,
Date:	Sept. 2009		GS, ν_4, $2\nu_4$, ν_5, $2\nu_5$, $\nu_4+\nu_5$
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Lines Listed:	2066	Q(300.0)=	420.3041
Freq. (GHz) <	25210	Q(225.0)=	282.7134
Max. J:	90	Q(150.0)=	179.2419
LOGSTR0=	-10.0	Q(75.00)=	89.2856
LOGSTR1=	-10.0	Q(37.50)=	44.9772
Isotope Corr.:	0.0	Q(18.75)=	22.8305
Egy. (cm^{-1}) >	0.0	Q(9.375)=	11.7671
μ_a =	0.051	A=	
μ_b =		B=	35274.9596
μ_c =	0.051	C=	

The following states are included in this calculation: the ground state, ν_4, $2\nu_4$, ν_5, $2\nu_5$, $\nu_4+\nu_5$. The vibrational levels are labeled as $V_4^{l_4}V_5^{l_5}$. The vibrational designations are as the following: 00 for 0^00^0 ($^1\Sigma_g{}^+$); 01 for 1^10^0 ($^1\Pi_g$); 02 for 0^01^1 ($^1\Pi_u$), 03 for 2^20^0 ($^1\Delta_g$), 04 for 2^00^0 ($^1\Sigma_g{}^+$), 05 for 1^11^1 ($^1\Sigma_u{}^+$), 06 for 1^11^1 ($^1\Delta_u$); 07 for 1^11^1 ($^1\Sigma_u{}^-$); 08 for 0^02^0 ($^1\Sigma_g{}^+$); 09 for 0^02^2 ($^1\Delta_g$). The experimental measurements were reported by Kabbadj et al. 1991, J. Mol. Spectrosc. **150**, 535. Yu et al., 2009, Astrophys. J. 705(1), 786-790.

A vibrational transition dipole moment of 0.051 D, which was determined with an uncertainty of 20% for the ν_5-ν_4 difference band by Robert et al. (2007, Mol. Phys., **105**, 2009), was used for all the transitions because dipole moments for other bands are not available. The intensities for transitions in the ν_5-ν_4 difference band are therefore uncertain to about 40%. The intensities for rotational lines in other vibrational bands should be viewed with more caution since there might be systematic errors. Note that our analysis included experimental data with J_{max} = 43 for the ground state ($^1\Sigma_g{}^+$); 38 for ν_4($^1\Pi_g$); 41 for ν_5($^1\Pi_u$); 37 for $2\nu_4$($^1\Delta_g$); 31 for $2\nu_4$($^1\Sigma_g{}^+$); 42 for $\nu_4+\nu_5$($^1\Sigma_u{}^+$); 40 for $\nu_4+\nu_5$($^1\Delta_u$); 31 for $\nu_4+\nu_5$($^1\Sigma_u{}^-$); 31 for $2\nu_5$($^1\Sigma_g{}^+$); 34 for $2\nu_5$($^1\Delta_g$). Transitions up to J = 40 should be predicted reliably and should be found within 0 - 10 times the predicted uncertainties.