

Tables of Vibrational Rotational
Transitions in Diatomic Molecules
Pertinent to Chemical Lasers

D. Proch^{+) and J. Wanner^{+))}}

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MAX-PLANCK-INSTITUT FÜR PLASMAPHYSIK

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+)

Institut für Anorganische Chemie
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IPP IV/17 D. Proch
J. Wanner

Tables of Vibrational Rotational
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March 1971 (in English)

Abstract:

In this report vibrational rotational energies and transition wavenumbers are given for the following molecules: Hydrogen fluoride HF, deuterium fluoride DF, hydrogen chloride and deuterium chloride HCl, DCl (both chlorine isotopes), hydrogen bromide and deuterium bromide HBr, DBr (both bromine isotopes), carbon monoxide CO, nitric oxide NO(${}^2\Pi_{1/2, 3/2}$). These reference tables which have been checked wherever possible against experimental data are included to provide a quick and reliable spectroscopic identification of emission lines in diatomic molecular lasers.

C O N T E N T S

Introductory remarks, scope of compilation 1

Hydrogen fluoride, HF 6

Deuterium fluoride, DF 10

Hydrogen chloride, HCl³⁵ 14

Hydrogen chloride, HCl³⁷ 18

Deuterium chloride, DCl³⁵ 22

Deuterium chloride, DCl³⁷ 26

Hydrogen bromide, HBr⁷⁹ 30

Hydrogen bromide, HBr⁸¹ 34

Deuterium bromide, DBr⁷⁹ 38

Deuterium bromide, DBr⁸¹ 42

Carbon monoxide, CO 46

Nitric oxide, NO(²Π_{1/2, 3/2}) 53

References 66

$$T_{v_j} = 2 \dots$$

and J are the vibrational and rotational quantum numbers, and D is the Dunham coefficient. For diatomic molecules the more common spectroscopic notation v, J is used in the literature. These constants can be expressed in terms of coefficients,

Introductory remarks, scope of compilation

A number of chemical reactions leads to the formation of diatomic products which exhibit a complete inversion in the vibration rotation levels of the electronic ground state. These simple reactions are used as pumping reactions in various chemical laser systems.

The purpose of this paper is to provide a compendium of frequencies and energy levels of rotational vibrational lines, which may be important for molecular chemical or gasdynamical lasers. This study was prompted by the fact that experimental or calculated frequencies of molecular transitions are scattered.

Up to now stimulated emission due to chemical pumping has been observed from the hydrogen halides HF, HCl, HBr, including their deuterio-isotopes, and CO /1/.

Generally only P-branch transitions ($\Delta J = +1$ in emission) have been observed because the gain for these transitions is higher than that for R-branch transitions starting from the same level /2/. However, R-branch lines are included here too, because they have been observed using a selective resonator /3/.

The calculated wavenumbers for the P-branch transitions are compared to experimental as well as to calculated wavenumbers given in the cited references. Rotation vibration levels (with the exception of NO, see below) are calculated using Dunham's formula of the eigenvalues of the rotating vibrator /4/

$$T_{vJ} = \sum_{\ell j} Y_{\ell j} (v + 1/2)^{\ell} J^j (J + 1)^j$$

where v and J are the vibrational and rotational quantum numbers, and $Y_{\ell j}$ are the Dunham coefficients. For most of the molecules the more conventional spectroscopic notation of constants is used in the literature. These constants can be treated as Dunham coefficients, using the relations:

$$\begin{array}{lll}
 Y_{10} = \omega_e & Y_{01} = B_e & Y_{11} = -\alpha_e \\
 Y_{20} = -\omega_e x_e & Y_{02} = -D_e & Y_{12} = \beta_e \\
 Y_{30} = \omega_e y_e & Y_{03} = H_e & Y_{21} = \gamma_e \\
 Y_{40} = \omega_e z_e & &
 \end{array}$$

This becomes clear if Dunham's formula is expanded and its lowest powers are compared with the familiar spectroscopic term formula /5/, namely

$$\begin{aligned}
 T_{vJ} = & \omega_e (v+1/2) - \omega_e x_e (v+1/2)^2 + \omega_e y_e (v+1/2)^3 + \omega_e z_e (v+1/2)^4 + \dots \\
 & + B_e J(J+1) - D_e J^2(J+1)^2 + H_e J^3(J+1)^3 + \dots \\
 & - \alpha_e (v+1/2)J(J+1) + \beta_e (v+1/2)J^2(J+1)^2 + \gamma_e (v+1/2)^2 J(J+1) + \dots
 \end{aligned}$$

For some deuterium halides we obtained Dunham coefficients using the isotopic relationship /4/

$$Y_{\ell j}^i = Y_{\ell j} \varrho^{(\ell+2j)}$$

The superscript i refers to the isotope. The factor ϱ is given as $\varrho = (\mu / \mu^i)^{1/2}$ where μ and μ^i are the reduced masses. Constants used here are given in the computer output*). Zero point energy has been subtracted in all term values.

Calculated wavenumbers refer to vacuum, of course. Therefore any measured value in air must be corrected. The correction is obtained from Fig.1, according to

$$\omega_{VAC} = \omega_{AIR} - \Delta\omega$$

*) Values of $\omega_e x_e$ for HCl^{35} and HCl^{37} are given with wrong sign in the reference /11/. Also the power of Y_{31} of HF should be corrected /12/.

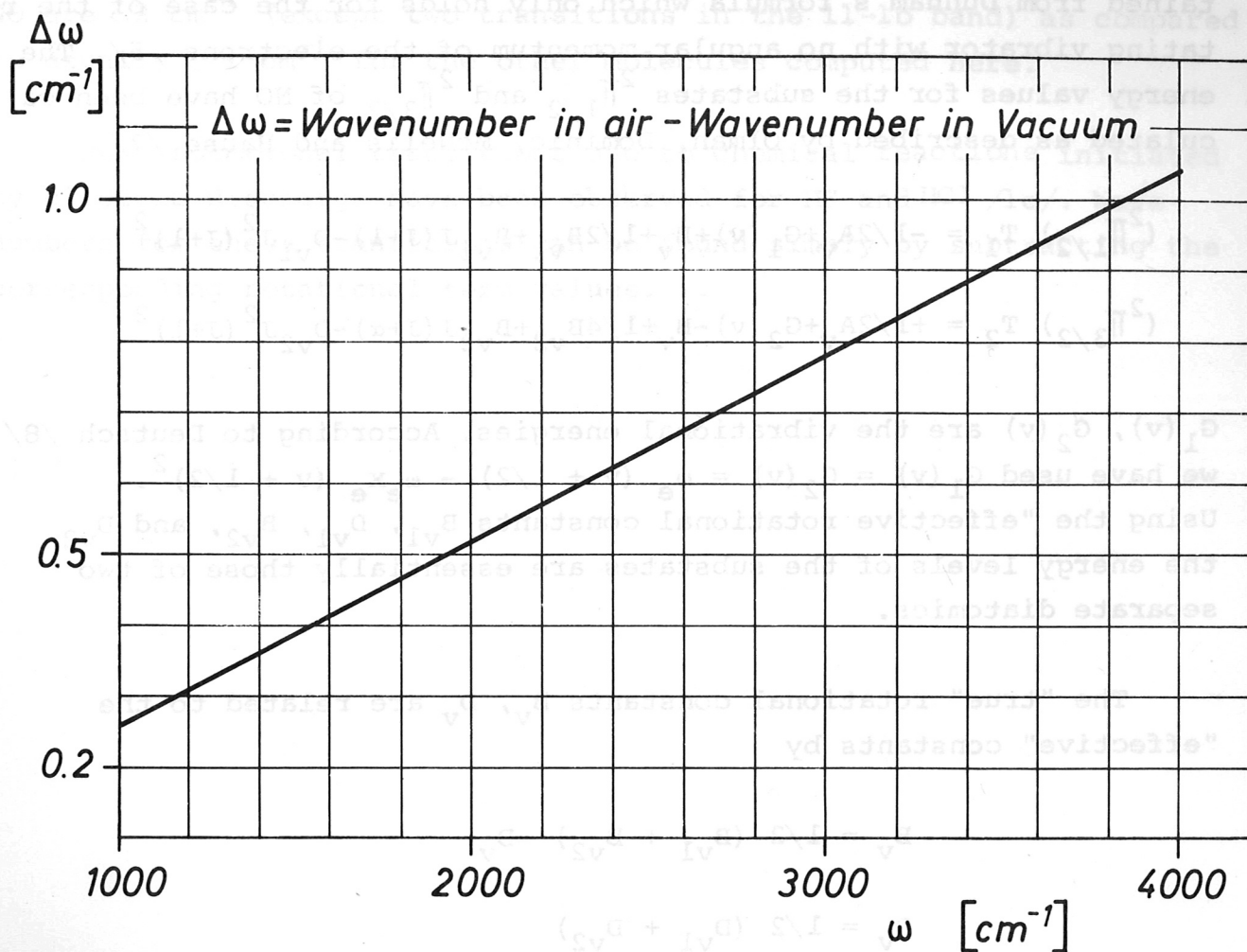


Fig.1 Conversion diagram for wave numbers in air /13/.
 (T = 22.5 °C; p = 745 Torr; relative humidity = 30 percent)

The isotopes HCl^{37} (DCl^{37}) and HBr^{81} (DBr^{81}) had to be included because of the natural abundance of Cl^{37} and Br^{81} with 24.5 % and 49.5 % respectively.

Laser emission of nitric oxide NO has been observed in photo-dissociation of NOCl /6/. Nitric oxide is the only stable diatomic molecule having an odd number of electrons and an electronic angular momentum. As a result it has a $^2\Pi$ ground state whose components are separated by about 120 cm^{-1} by spin orbit interaction. The effect of Λ doubling in this case is negligibly small /7/.

Because of this angular momentum the energy levels cannot be obtained from Dunham's formula which only holds for the case of the rotating vibrator with no angular momentum of the electrons /5/. The energy values for the substates ${}^2\Pi_{1/2}$ and ${}^2\Pi_{3/2}$ of NO have been calculated as described by Olman, Dominic, McNelis and Hause /7/.

$$({}^2\Pi_{1/2}) T_1 = -1/2A_v + G_1(v) + B_v + 1/2B_{v1} + B_{v1}J(J+1) - D_{v1}J^2(J+1)^2$$

$$({}^2\Pi_{3/2}) T_2 = +1/2A_v + G_2(v) - B_v + 1/4B_{v2} + B_{v2}J(J+\alpha) - D_{v2}J^2(J+1)^2$$

$G_1(v)$, $G_2(v)$ are the vibrational energies. According to Deutsch /8/ we have used $G_1(v) = G_2(v) = \omega_e(v + 1/2) - \omega_e x_e(v + 1/2)^2$. Using the "effective rotational constants B_{v1} , D_{v1} , B_{v2} , and D_{v2} " the energy levels of the substates are essentially those of two separate diatomics.

The "true" rotational constants B_v , D_v are related to the "effective" constants by

$$B_v = 1/2 (B_{v1} + B_{v2}) - D_v$$

$$D_v = 1/2 (D_{v1} + D_{v2})$$

The spin orbit constant A_v is defined as

$$A_v = A_e - \alpha_e^A (v+1/2).$$

The value for A_e has been taken from Olman et al. /7/. Deutsch /8/ gives an additional correction term $\gamma^A (v+1/2)^2$ which did not improve our results and has been ignored here.

The transitions are labelled as in the references /8/, P(J-1/2), R(J-1/2) and so on. Accordingly P(2) of the ${}^2\Pi_{3/2}$ state stands for the lowest P-branch transition $J = 5/2 \rightarrow J = 3/2$. The Q-branch of NO has been ignored here. The results with the various rotational constants of the quoted references /8/, /9/ are in good agreement.

The differences between experimental and calculated numbers for NO are $<.2 \text{ cm}^{-1}$ (except two transitions in the 11-10 band) as compared to usually $<.1 \text{ cm}^{-1}$ for the other molecules computed here.

Pure rotational transitions due to chemical reactions initiated by electric discharge have been observed for HF and HCl /10/. Wave-numbers for these transitions can be found simply by subtracting the corresponding rotational term values.

	V = 1	V = 2
1161.57	7750.98	
4001.13	7789.03	
4380.21	7865.10	
4769.28	7941.17	
5158.35	8017.24	
5547.42	8093.31	
5936.49	8169.38	
6325.56	8245.45	
6714.63	8321.52	
7103.70	8397.59	
7492.77	8473.66	
7881.84	8549.73	
8270.91	8625.80	
8659.98	8701.87	
9049.05	8777.94	
9438.12	8854.01	
9827.19	8930.08	
10216.26	9006.15	
10605.33	9082.22	
10994.40	9158.29	
11383.47	9234.36	
11772.54	9310.43	
12161.61	9386.50	
12550.68	9462.57	
12939.75	9538.64	
13328.82	9614.71	
13717.89	9690.78	
14106.96	9766.85	
14496.03	9842.92	
14885.10	9918.99	
15274.17	9995.06	
15663.24	10071.13	
16052.31	10147.20	
16441.38	10223.27	
16830.45	10299.34	
17219.52	10375.41	
17608.59	10451.48	
18000.00	10527.55	
18390.00	10603.62	
18780.00	10679.69	
19170.00	10755.76	
19560.00	10831.83	
19950.00	10907.90	
20340.00	10983.97	
20730.00	11060.04	
21120.00	11136.11	
21510.00	11212.18	
21900.00	11288.25	
22290.00	11364.32	
22680.00	11440.39	
23070.00	11516.46	
23460.00	11592.53	
23850.00	11668.60	
24240.00	11744.67	
24630.00	11820.74	
25020.00	11896.81	
25410.00	11972.88	
25800.00	12048.95	
26190.00	12125.02	
26580.00	12201.09	
26970.00	12277.16	
27360.00	12353.23	
27750.00	12429.30	
28140.00	12505.37	
28530.00	12581.44	
28920.00	12657.51	
29310.00	12733.58	
29700.00	12809.65	
30090.00	12885.72	
30480.00	12961.79	
30870.00	13037.86	
31260.00	13113.93	
31650.00	13190.00	
32040.00	13266.07	
32430.00	13342.14	
32820.00	13418.21	
33210.00	13494.28	
33600.00	13570.35	
33990.00	13646.42	
34380.00	13722.49	
34770.00	13798.56	
35160.00	13874.63	
35550.00	13950.70	
35940.00	14026.77	
36330.00	14102.84	
36720.00	14178.91	
37110.00	14254.98	
37500.00	14331.05	
37890.00	14407.12	
38280.00	14483.19	
38670.00	14559.26	
39060.00	14635.33	
39450.00	14711.40	
39840.00	14787.47	
40230.00	14863.54	
40620.00	14939.61	
41010.00	15015.68	
41400.00	15091.75	
41790.00	15167.82	
42180.00	15243.89	
42570.00	15320.00	
42960.00	15396.11	
43350.00	15472.22	
43740.00	15548.33	
44130.00	15624.44	
44520.00	15700.55	
44910.00	15776.66	
45300.00	15852.77	
45690.00	15928.88	
46080.00	16004.99	
46470.00	16081.10	
46860.00	16157.21	
47250.00	16233.32	
47640.00	16309.43	
48030.00	16385.54	
48420.00	16461.65	
48810.00	16537.76	
49200.00	16613.87	
49590.00	16689.98	
49980.00	16766.09	
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50760.00	16918.31	
51150.00	16994.42	
51540.00	17070.53	
51930.00	17146.64	
52320.00	17222.75	
52710.00	17298.86	
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54270.00	17603.30	
54660.00	17679.41	
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55440.00	17831.63	
55830.00	17907.74	
56220.00	17983.85	
56610.00	18059.96	
57000.00	18136.07	
57390.00	18212.18	
57780.00	18288.29	
58170.00	18364.40	
58560.00	18440.51	
58950.00	18516.62	
59340.00	18592.73	
59730.00	18668.84	
60120.00	18744.95	
60510.00	18821.06	
60900.00	18897.17	
61290.00	18973.28	
61680.00	19049.39	
62070.00	19125.50	
62460.00	19201.61	
62850.00	19277.72	
63240.00	19353.83	
63630.00	19429.94	
64020.00	19506.05	
64410.00	19582.16	
64800.00	19658.27	
65190.00	19734.38	
65580.00	19810.49	
65970.00	19886.60	
66360.00	19962.71	
66750.00	20038.82	
67140.00	20114.93	
67530.00	20191.04	
67920.00	20267.15	
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68700.00	20419.37	
69090.00	20495.48	
69480.00	20571.59	
69870.00	20647.70	
70260.00	20723.81	
70650.00	20800.00	
71040.00	20876.11	
71430.00	20952.22	
71820.00	21028.33	
72210.00	21104.44	
72600.00	21180.55	
72990.00	21256.66	
73380.00	21332.77	
73770.00	21408.88	
74160.00	21484.99	
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80010.00	22626.64	
80400.00	22702.75	
80790.00	22778.86	
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83130.00	23235.52	
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84300.00	23463.85	
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85470.00	23692.18	
85860.00	23768.29	
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86640.00	23920.51	
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87810.00	24148.84	
88200.00	24224.95	
88590.00	24301.06	
88980.00	24377.17	
89370.00	24453.28	
89760.00	24529.39	
90150.00	24605.50	
90540.00	24681.61	
90930.00	24757.72	
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91710.00	24910.00	
92100.00	24986.11	
92490.00	25062.22	
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93270.00	25214.44	
93660.00	25290.55	
94050.00	25366.66	
94440.00	25442.77	
94830.00	25518.88	
95220.00	25594.99	
95610.00	25671.10	
96000.00	25747.21	
96390.00	25823.32	
96780.00	25899.43	
97170.00	25975.54	
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98340.00	26203.87	
98730.00	26279.98	
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99510.00	26432.20	
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103800.00	27269.41	
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104580.00	27421.63	
104970.00	27497.74	
105360.00	27573.85	
105750.00	27649.96	
106140.00	27726.07	
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111600.00	28791.61	
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112380.00	28943.83	
112770.00	29019.94	
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116280.00	29704.93	
116670.00	29781.04	
117060.00	29857.15	
117450.00	29933.26	
117840.00	30009.37	
118230.00	30085.48	
118620.00	30161.59	
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119400.00	30313.81	
119790.00	30389.92	
120180.00	30466.03	
120570.00	30542.14	
120960.00	30618.25	
121350.00	30694.36	
121740.00	30770.47	
122130.00	30846.58	
122520.00	30922.69	
122910.00	30998.80	
123300.00	31074.91	
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124080.00	31227.13	
124470.00	31303.24	
124860.00	31379.35	
125250.00	31455.46	
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127980.00	31988.23	
128370.00	32064.34	
128760.00	32140.45	
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131100.00	32597.11	
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132270.00	32825.44	
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133050.00	32977.66	
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134610.00	33282.10	
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135390.00	33434.32	
135780.00	33510.43	
136170.00	33586.54	
136560.00	33662.65	
136950.00	33738.76	
137340.00	33814.87	
137730.00	33890.98	
138120.00	33967.09	
138510.00	34043.20	
138900.00	34119.31	
139290.00	34195.42	
139680.00	34271.53	
140070.00	34347.64	
140460.00	34423.75	
140850.00	34500.00	
141240.00	34576.11	
141630.00	34	

HYDROGEN FLUORIDE (HF)

LIST OF INPUT DATA

Y10=	0.41387E 04	Y20=	-0.90050E 02	Y30=	0.93200E 00	Y40=	-0.14200E-01	Y50=	-0.59000E-03
Y01=	0.20955E 02	Y11=	-0.79580E 00	Y21=	0.11820E-01	Y31=	-0.31100E-03	Y41=	-0.58000E-05
Y02=	-0.21530E-02	Y03=	0.16800E-06	Y04=	-0.19000E-10	Y12=	0.62300E-04	Y13=	-0.65000E-08
Y22=	-0.20600E-05								

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DUNHAM COEFFICIENTS FOR HF ARE TAKEN FROM REFERENCE (12).

HYDROGEN FLUORIDE (HF)

ENERGY LEVELS IN 1/CM

J=	V = 0	V = 1	V = 2	V = 3	V = 4	V = 5	V = 6	V = 7	V = 8
J= 0	0.0	3961.57	7750.98	11372.97	14831.80	18131.10	21273.89	24262.42	27098.16
J= 1	41.11	4001.13	7789.03	11409.55	14866.95	18164.84	21306.24	24293.40	27127.78
J= 2	123.29	4080.21	7865.10	11482.69	14937.21	18232.30	21370.93	24355.36	27187.02
J= 3	246.42	4198.70	7979.09	11592.29	15042.51	18333.37	21467.85	24448.18	27275.78
J= 4	410.36	4356.48	8130.86	11738.19	15182.68	18467.92	21596.87	24571.73	27393.91
J= 5	614.91	4553.32	8320.20	11920.22	15357.56	18635.78	21757.83	24725.86	27541.27
J= 6	859.81	4788.98	8546.89	12138.14	15566.91	18836.71	21950.48	24910.33	27717.63
J= 7	1144.76	5063.20	8810.63	12391.68	15810.45	19070.46	22174.59	25124.90	27922.74
J= 8	1469.41	5375.59	9111.09	12680.50	16087.89	19336.72	22429.83	25369.27	28156.31
J= 9	1833.37	5725.80	9447.92	13004.25	16398.85	19635.13	22715.88	25643.10	28418.02
J= 10	2236.17	6113.38	9820.66	13362.51	16742.94	19965.29	23032.34	25946.02	28707.47
J= 11	2677.36	6537.86	10228.86	13754.82	17119.69	20326.79	23378.79	26277.58	29024.27
J= 12	3156.39	6998.73	10672.04	14180.71	17528.66	20719.14	23754.77	26637.36	29367.96
J= 13	3672.67	7495.41	11149.60	14639.63	17969.30	21141.82	24159.75	27024.85	29738.04
J= 14	4225.58	8027.28	11660.98	15130.99	18441.05	21594.30	24593.22	27439.50	30134.01
J= 15	4814.47	8593.73	12205.56	15654.18	18943.29	22075.96	25054.59	27880.76	30555.29
J= 16	5438.63	9194.06	12782.66	16208.56	19475.41	22586.20	25543.24	28348.04	31001.29
J= 17	6097.32	9827.55	13391.57	16793.44	20036.75	23124.36	26058.53	28840.66	31471.37
J= 18	6789.77	10493.45	14031.55	17408.11	20626.56	23689.73	26599.77	29357.98	31964.88
J= 19	7515.15	11190.95	14701.85	18051.77	21244.12	24281.58	27166.23	29899.27	32481.10
J= 20	8272.63	11919.23	15401.64	18723.68	21888.65	24899.18	27757.18	30463.82	33019.31

6-07111111 IN TACK

HYDROGEN FLUORIDE (HF)

HYDROGEN FLUORIDE (HF)

P-BRANCH IN 1/CM

	1 - 0	2 - 1	3 - 2	4 - 3	5 - 4	6 - 5	7 - 6	8 - 7
P(1)	3920.46	3749.85	3583.95	3422.25	3264.16	3109.05	2956.18	2804.75
P(2)	3877.84	3708.82	3544.45	3384.25	3227.63	3073.95	2922.47	2772.43
P(3)	3833.79	3666.40	3503.60	3344.93	3189.79	3037.57	2887.50	2738.84
P(4)	3788.34	3622.62	3461.43	3304.32	3150.69	2999.93	2851.30	2704.04
P(5)	3741.57	3577.54	3417.99	3262.45	3110.36	2961.09	2813.91	2668.05
P(6)	3693.51	3531.22	3373.34	3219.42	3068.87	2921.12	2775.38	2630.94
P(7)	3644.22	3483.69	3327.50	3175.23	3026.26	2880.02	2735.75	2592.73
P(8)	3593.79	3435.04	3280.58	3129.95	2982.57	2837.87	2695.07	2553.47
P(9)	3542.22	3385.29	3232.58	3083.64	2937.87	2794.70	2653.39	2513.21
P(10)	3489.63	3334.54	3183.59	3036.34	2892.19	2750.59	2610.76	2472.00
P(11)	3436.02	3282.80	3133.65	2988.11	2845.60	2705.55	2567.23	2429.89
P(12)	3381.47	3230.13	3082.79	2938.98	2798.13	2659.65	2522.82	2386.90
P(13)	3326.06	3176.63	3031.11	2889.04	2749.84	2612.94	2477.61	2343.11
P(14)	3269.82	3122.32	2978.64	2838.31	2700.78	2565.46	2431.63	2298.54
P(15)	3212.81	3067.26	2925.43	2786.87	2651.01	2517.26	2384.92	2253.25
P(16)	3155.10	3011.50	2871.52	2734.72	2600.55	2468.38	2337.52	2207.25
P(17)	3096.74	2955.11	2817.00	2681.97	2549.45	2418.88	2289.51	2160.62
P(18)	3037.79	2898.11	2761.89	2628.64	2497.80	2368.80	2240.90	2113.39
P(19)	2978.30	2840.61	2706.26	2574.79	2445.61	2318.18	2191.75	2065.61
P(20)	2918.32	2782.61	2650.14	2520.44	2392.93	2267.05	2142.09	2017.28

EMERGENCY TELEPHONE IN EACH

HYDROGEN FLUORIDE (HF)

HYDROGEN FLUORIDE (HF)

R-BRANCH IN 1/CM

	1 - 0	2 - 1	3 - 2	4 - 3	5 - 4	6 - 5	7 - 6	8 - 7
R(0)	4001.13	3827.45	3658.57	3493.97	3333.04	3175.14	3019.51	2865.36
R(1)	4039.10	3863.97	3693.66	3527.66	3365.35	3206.09	3049.11	2893.62
R(2)	4075.42	3898.88	3727.19	3559.82	3396.15	3235.55	3077.24	2920.42
R(3)	4110.05	3932.15	3759.10	3590.39	3425.41	3263.50	3103.88	2945.73
R(4)	4142.96	3963.73	3789.37	3619.37	3453.10	3289.91	3128.99	2969.54
R(5)	4174.07	3993.57	3817.93	3646.68	3479.15	3314.70	3152.50	2991.77
R(6)	4203.39	4021.65	3844.79	3672.31	3503.55	3337.88	3174.43	3012.41
R(7)	4230.83	4047.89	3869.87	3696.21	3526.27	3359.37	3194.68	3031.41
R(8)	4256.39	4072.33	3893.16	3718.35	3547.24	3379.16	3213.27	3048.75
R(9)	4280.01	4094.86	3914.59	3738.69	3566.45	3397.21	3230.13	3064.38
R(10)	4301.69	4115.48	3934.16	3757.18	3583.85	3413.50	3245.25	3078.25
R(11)	4321.37	4134.17	3951.85	3773.84	3599.45	3427.98	3258.57	3090.38
R(12)	4339.02	4150.87	3967.59	3788.59	3613.16	3440.61	3270.08	3100.68
R(13)	4354.61	4165.58	3981.39	3801.42	3625.00	3451.40	3279.75	3109.16
R(14)	4368.14	4178.28	3993.19	3812.30	3634.91	3460.29	3287.54	3115.78
R(15)	4379.59	4188.93	4003.00	3821.24	3642.92	3467.28	3293.45	3120.52
R(16)	4388.92	4197.51	4010.79	3828.19	3648.95	3472.32	3297.43	3123.33
R(17)	4396.13	4204.00	4016.54	3833.12	3652.98	3475.41	3299.45	3124.21
R(18)	4401.18	4208.39	4020.22	3836.01	3655.02	3476.50	3299.51	3123.12
R(19)	4404.08	4210.69	4021.83	3836.88	3655.06	3475.60	3297.59	3120.04

DEUTERIUM FLUORIDE (DF)

LIST OF INPUT DATA

Y10=	0.30004E 04	Y20=	-0.47326E 02	Y30=	0.35509E 00	Y40=	-0.39221E-02	Y50=	-0.11814E-03
Y01=	C.11013E 02	Y11=	-0.30320E 00	Y21=	0.32647E-02	Y31=	-0.62273E-04	Y41=	-0.84193E-06
Y02=	-0.59467E-03	Y03=	0.24387E-07	Y04=	-0.14495E-11	Y12=	0.12475E-04	Y13=	-0.68402E-09
Y22=	-C.29903E-06								

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(16) R.N. SPANBAUER, K.N. RAO
 J. MOL. SPECTR. 16, 100 (1965)

(15) T.F. DEUTSCH
 APPL. PHYS. LETTERS 10, 234 (1967)

(CHEMICAL LASER EMISSION)

DUNHAM COEFFICIENTS FOR DF ARE OBTAINED FROM HF COEFFICIENTS, GIVEN IN
 REF. (12)', BY USING THE ISOTOPIIC RELATIONSHIP OF REF. (4)

B-BRANCH 14 TACA

HARDWARE FLUORIDE TABLE

DEUTERIUM FLUORIDE (DF)

ENERGY LEVELS IN 1/CM

J=	V = 0	V = 1	V = 2	V = 3	V = 4	V = 5	V = 6	V = 7	V = 8
J= 0	0.0	2906.84	5722.11	8447.72	11085.44	13636.91	16103.62	18486.87	20787.79
J= 1	21.72	2927.95	5742.65	8467.68	11104.84	13655.76	16121.93	18504.64	20805.03
J= 2	65.15	2970.20	5783.73	8507.62	11143.66	13693.47	16158.55	18540.20	20839.53
J= 3	130.26	3033.53	5845.31	8567.49	11201.86	13750.02	16213.47	18593.51	20891.25
J= 4	217.01	3117.90	5927.37	8647.27	11279.39	13825.35	16286.63	18664.53	20960.15
J= 5	325.34	3223.27	6029.83	8746.89	11376.20	13919.41	16377.99	18753.21	21046.20
J= 6	455.18	3349.56	6152.64	8866.28	11492.24	14032.14	16487.47	18859.49	21149.30
J= 7	606.45	3496.70	6295.71	9005.36	11627.42	14163.48	16615.01	18983.29	21269.41
J= 8	779.05	3664.56	6458.95	9164.05	11781.64	14313.32	16760.53	19124.53	21406.44
J= 9	972.87	3853.06	6642.25	9342.25	11954.83	14481.57	16923.91	19283.13	21560.28
J= 10	1187.78	4062.08	6845.49	9539.83	12146.84	14668.11	17105.05	19458.95	21730.85
J= 11	1423.64	4291.47	7068.54	9756.66	12357.56	14872.80	17303.83	19651.88	21917.98
J= 12	1680.30	4541.09	7311.26	9992.61	12586.84	15095.54	17520.11	19861.77	22121.59
J= 13	1957.61	4810.79	7573.48	10247.50	12834.53	15336.14	17753.73	20088.51	22341.51
J= 14	2255.37	5100.36	7855.04	10521.18	13100.46	15594.46	18004.55	20331.91	22577.59
J= 15	2573.41	5409.65	8155.75	10813.46	13384.47	15870.32	18272.38	20591.82	22829.66
J= 16	2911.51	5738.45	8475.41	11124.16	13686.38	16163.55	18557.06	20868.06	23097.55
J= 17	3269.45	6086.53	8813.82	11453.07	14005.94	16473.93	18858.38	21160.43	23381.06
J= 18	3647.03	6453.70	9170.77	11799.99	14342.99	16801.27	19176.14	21468.74	23680.01
J= 19	4044.01	6839.71	9546.02	12164.68	14697.30	17145.36	19510.14	21792.78	23994.20
J= 20	4460.12	7244.31	9939.34	12546.91	15068.63	17505.95	19860.14	22132.32	24323.38

6-DEUTERIUM FLUORIDE (DF)
ENERGY LEVELS IN 1/CM

DEUTERIUM FLUORIDE (DF)

P-BRANCH IN 1/CM

	1 - 0	2 - 1	3 - 2	4 - 3	5 - 4	6 - 5	7 - 6	8 - 7
P(1)	2885.12	2794.16	2705.07	2617.76	2532.07	2447.86	2364.94	2283.14
P(2)	2862.80	2772.45	2683.95	2597.22	2512.10	2428.46	2346.09	2264.83
P(3)	2839.94	2750.20	2662.31	2576.17	2491.62	2408.53	2326.73	2246.02
P(4)	2816.52	2727.41	2640.13	2554.59	2470.63	2388.12	2306.88	2226.72
P(5)	2792.56	2704.09	2617.44	2532.50	2449.15	2367.22	2286.54	2206.94
P(6)	2768.09	2680.27	2594.25	2509.92	2427.17	2345.85	2265.74	2186.71
P(7)	2743.11	2655.94	2570.57	2486.88	2404.72	2323.99	2244.48	2166.01
P(8)	2717.65	2631.15	2546.42	2463.36	2381.84	2301.69	2222.77	2144.88
P(9)	2691.69	2605.89	2521.81	2439.39	2358.49	2278.96	2200.62	2123.31
P(10)	2665.28	2580.17	2496.76	2415.00	2334.73	2255.81	2178.07	2101.33
P(11)	2638.44	2554.02	2471.29	2390.18	2310.55	2232.25	2155.11	2078.97
P(12)	2611.17	2527.45	2445.40	2364.95	2285.96	2208.30	2131.77	2056.21
P(13)	2583.49	2500.47	2419.13	2339.34	2261.01	2183.96	2108.04	2033.08
P(14)	2555.41	2473.12	2392.46	2313.35	2235.68	2159.26	2083.96	2009.60
P(15)	2526.96	2445.39	2365.43	2287.00	2209.99	2134.22	2059.53	1985.77
P(16)	2498.15	2417.30	2338.05	2260.31	2183.95	2108.83	2034.76	1961.59
P(17)	2468.99	2388.88	2310.34	2233.30	2157.61	2083.13	2009.68	1937.12
P(18)	2439.49	2360.13	2282.31	2205.95	2130.94	2057.11	1984.29	1912.32
P(19)	2409.68	2331.06	2253.97	2178.32	2103.96	2030.78	1958.59	1887.23
P(20)	2379.59	2301.71	2225.34	2150.40	2076.73	2004.20	1932.64	1861.88

DEUTERIUM FLUORIDE (DF)

R-BRANCH IN 1/CM

	1 - 0	2 - 1	3 - 2	4 - 3	5 - 4	6 - 5	7 - 6	8 - 7
R(0)	2927.95	2835.81	2745.57	2657.12	2570.32	2485.02	2401.02	2318.16
R(1)	2948.48	2855.78	2764.97	2675.98	2588.63	2502.79	2418.27	2334.89
R(2)	2968.38	2875.11	2783.76	2694.23	2606.36	2520.00	2434.96	2351.05
R(3)	2987.64	2893.84	2801.95	2711.89	2623.50	2536.61	2451.06	2366.64
R(4)	3006.26	2911.93	2819.52	2728.93	2640.02	2552.64	2466.58	2381.67
R(5)	3024.22	2929.37	2836.45	2745.35	2655.94	2568.06	2481.50	2396.09
R(6)	3041.51	2946.15	2852.72	2761.14	2671.24	2582.87	2495.82	2409.93
R(7)	3058.10	2962.25	2868.35	2776.28	2685.90	2597.05	2509.52	2423.15
R(8)	3074.01	2977.69	2883.31	2790.77	2699.92	2610.59	2522.60	2435.75
R(9)	3089.21	2992.43	2897.59	2804.59	2713.28	2623.49	2535.03	2447.72
R(10)	3103.70	3006.47	2911.16	2817.73	2725.96	2635.73	2546.82	2459.03
R(11)	3117.46	3019.79	2924.06	2830.18	2737.99	2647.30	2557.93	2469.71
R(12)	3130.48	3032.39	2936.24	2841.92	2749.30	2658.19	2568.40	2479.74
R(13)	3142.76	3044.25	2947.70	2852.97	2759.94	2668.41	2578.14	2489.08
R(14)	3154.28	3055.38	2958.43	2863.30	2769.86	2677.91	2587.27	2497.75
R(15)	3165.04	3065.76	2968.41	2872.91	2779.08	2686.73	2595.68	2505.73
R(16)	3175.02	3075.38	2977.66	2881.78	2787.56	2694.83	2603.37	2513.00
R(17)	3184.24	3084.24	2986.17	2889.92	2795.33	2702.21	2610.36	2519.58
R(18)	3192.67	3092.32	2993.91	2897.31	2802.37	2708.88	2616.64	2525.46
R(19)	3200.30	3099.63	3000.89	2903.95	2808.64	2714.78	2622.18	2530.61

HYDROGEN CHLORIDE (HCL). CHLORIDE ISOTOPE 35.

LIST OF INPUT DATA

Y10=	0.29907E 04	Y20=	-0.52571E 02	Y30=	0.12916E 00	Y40=	0.0	Y50=	0.0
Y01=	C.10593E 02	Y11=	-0.30547E 00	Y21=	0.90100E-03	Y31=	0.0	Y41=	0.0
Y02=	-0.53170E-03	Y03=	0.0	Y04=	0.0	Y12=	0.64000E-05	Y13=	0.0
Y22=	0.0								

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J. MCL. SPECTROSCOPY 17, 122 (1965) (ABSORPTION)
 - (18) T.F. DEUTSCH
IEEE J. QUANTUM ELECTRONICS QE 3., 419 (1967) (CHEMICAL LASER EMISSION)
- SPECTROSCOPIC CONSTANTS FOR HCL 35 AND HCL 37 ARE GIVEN BY :
- (11) P.A. LEVY, F. ROSSI, AND C. HAEUSLER
J. PHYSIQUE 27, 526 (1966)

HYDROGEN CHLORIDE (HCL). CHLORIDE ISOTOPE 35.

ENERGY LEVELS IN I/CM

J =	V = 0	V = 1	V = 2	V = 3	V = 4	V = 5	V = 6	V = 7	V = 8
J = 0	0.0	2885.97	5667.97	8346.77	10923.14	13397.86	15771.70	18045.43	20219.83
J = 1	20.88	2906.24	5687.63	8365.83	10941.61	13415.73	15788.98	18062.13	20235.95
J = 2	62.62	2946.77	5726.96	8403.95	10978.54	13451.47	15823.54	18095.52	20268.17
J = 3	125.21	3007.53	5785.91	8461.11	11033.91	13505.06	15875.36	18145.58	20316.49
J = 4	208.60	3088.49	5864.45	8537.25	11107.66	13576.45	15944.39	18212.27	20380.86
J = 5	312.74	3189.60	5962.54	8632.35	11199.78	13665.61	16030.61	18295.56	20461.23
J = 6	437.57	3310.79	6080.12	8746.33	11310.19	13772.46	16133.93	18395.37	20557.56
J = 7	583.01	3451.99	6217.10	8879.12	11439.81	13896.94	16254.29	18511.65	20669.77
J = 8	748.97	3613.11	6373.40	9030.63	11585.56	14038.96	16391.62	18644.30	20797.78
J = 9	935.36	3794.04	6548.93	9200.77	11750.35	14198.43	16545.81	18793.23	20941.49
J = 10	1142.05	3994.69	6743.56	9389.43	11933.07	14375.26	16716.75	18958.35	21100.82
J = 11	1368.93	4214.92	6957.18	9596.48	12133.60	14569.29	16904.34	19139.53	21275.62
J = 12	1615.84	4454.59	7189.65	9821.80	12351.80	14780.42	17108.45	19336.65	21465.80
J = 13	1882.65	4713.56	7440.83	10065.23	12587.53	15008.50	17328.92	19549.57	21671.21
J = 14	2169.18	4991.66	7710.55	10326.61	12840.63	15253.38	17565.61	19778.13	21891.69
J = 15	2475.26	5288.71	7998.63	10605.79	13110.94	15514.87	17818.36	20022.17	22127.09
J = 16	2800.69	5604.53	8304.90	10902.55	13398.27	15792.82	18086.98	20281.53	22377.24
J = 17	3145.28	5938.92	8629.15	11216.73	13702.43	16087.02	18371.30	20556.01	22641.95
J = 18	3508.80	6291.67	8971.18	11548.10	14023.21	16397.29	18671.09	20845.42	22921.03
J = 19	3891.04	6662.54	9330.75	11896.45	14360.41	16723.29	18986.18	21149.55	23214.27
J = 20	4291.74	7051.30	9707.64	12261.54	14713.77	17065.10	19316.30	21468.17	23521.46

HYDROGEN CHLORIDE (HCL). CHLORIDE ISOTOPE 35.

P-BRANCH IN 1/CM

	1 - 0	2 - 1	3 - 2	4 - 3	5 - 4	6 - 5	7 - 6	8 - 7
P (1)	2865.10	2761.73	2659.14	2557.31	2456.25	2355.97	2256.45	2157.71
P (2)	2843.62	2740.86	2638.88	2537.66	2437.19	2337.50	2238.58	2140.43
P (3)	2821.56	2719.42	2618.04	2517.43	2417.57	2318.48	2220.15	2122.59
P (4)	2798.94	2697.42	2596.66	2496.65	2397.40	2298.91	2201.18	2104.22
P (5)	2775.75	2674.85	2574.71	2475.31	2376.67	2278.79	2181.67	2085.30
P (6)	2752.03	2651.76	2552.23	2453.45	2355.42	2258.15	2161.63	2065.86
P (7)	2727.78	2628.13	2529.23	2431.07	2333.65	2236.99	2141.08	2045.91
P (8)	2703.02	2603.99	2505.71	2408.18	2311.38	2215.33	2120.03	2025.47
P (9)	2677.75	2579.36	2481.71	2384.79	2288.61	2193.18	2098.49	2004.54
P (10)	2651.99	2554.23	2457.21	2360.92	2265.36	2170.55	2076.48	1983.14
P (11)	2625.77	2528.64	2432.25	2336.59	2241.66	2147.46	2054.01	1951.29
P (12)	2599.07	2502.60	2406.83	2311.80	2217.50	2123.92	2031.09	1938.97
P (13)	2571.93	2476.09	2380.96	2286.57	2192.89	2099.95	2007.73	1916.23
P (14)	2544.38	2449.18	2354.68	2260.92	2167.87	2075.54	1983.96	1893.09
P (15)	2516.40	2421.84	2327.98	2234.85	2142.44	2050.74	1959.77	1869.52
P (16)	2488.02	2394.10	2300.89	2208.38	2116.60	2025.54	1935.20	1845.56
P (17)	2459.26	2365.98	2273.41	2181.54	2090.39	1999.95	1910.23	1821.23
P (18)	2430.12	2337.48	2245.55	2154.33	2063.81	1974.01	1884.92	1796.53
P (19)	2400.62	2308.64	2217.35	2126.76	2036.88	1947.70	1859.24	1771.48
P (20)	2370.80	2279.45	2188.81	2098.86	2009.62	1921.08	1833.25	1746.10

HYDROGEN CHLORIDE (HCL). CHLORIDE ISOTOPE 35.

R-BRANCH IN 1/CM

	1 - 0	2 - 1	3 - 2	4 - 3	5 - 4	6 - 5	7 - 6	8 - 7
R(0)	2906.24	2801.66	2697.86	2594.84	2492.58	2391.12	2290.43	2190.52
R(1)	2925.89	2820.72	2716.32	2612.71	2509.86	2407.82	2306.54	2206.05
R(2)	2944.91	2839.14	2734.15	2629.95	2526.52	2423.89	2322.04	2220.98
R(3)	2963.28	2856.92	2751.34	2646.55	2542.54	2439.34	2336.91	2235.28
R(4)	2981.00	2874.05	2767.90	2662.52	2557.95	2454.16	2351.17	2248.96
R(5)	2998.05	2890.52	2783.79	2677.84	2572.68	2468.32	2364.77	2262.00
R(6)	3014.43	2906.31	2799.00	2692.48	2586.75	2481.84	2377.72	2274.40
R(7)	3030.10	2921.41	2813.54	2706.45	2600.16	2494.68	2390.01	2286.13
R(8)	3045.07	2935.82	2827.37	2719.72	2612.87	2506.84	2401.61	2297.19
R(9)	3059.34	2949.52	2840.51	2732.30	2624.91	2518.32	2412.54	2307.59
R(10)	3072.87	2962.49	2852.92	2744.16	2636.22	2529.09	2422.78	2317.27
R(11)	3085.66	2974.73	2864.61	2755.32	2646.82	2539.15	2432.31	2326.27
R(12)	3097.72	2986.25	2875.58	2765.73	2656.70	2548.50	2441.12	2334.56
R(13)	3109.01	2996.98	2885.78	2775.40	2665.84	2557.11	2449.21	2342.13
R(14)	3119.53	3006.97	2895.24	2784.32	2674.24	2564.98	2456.56	2348.96
R(15)	3129.27	3016.19	2903.93	2792.48	2681.88	2572.11	2463.18	2355.07
R(16)	3138.23	3024.62	2911.83	2799.88	2688.75	2578.49	2469.04	2360.42
R(17)	3146.39	3032.26	2918.95	2806.49	2694.86	2584.07	2474.13	2365.02
R(18)	3153.74	3039.09	2925.27	2812.30	2700.18	2588.89	2478.46	2368.85
R(19)	3160.26	3045.10	2930.79	2817.32	2704.70	2592.91	2481.99	2371.01

HYDROGEN CHLORIDE (HCL). CHLORIDE ISOTOPE 37.

LIST OF INPUT DATA

Y10=	0.29885E 04	Y20=	-0.52517E 02	Y30=	0.13301E 00	Y40=	0.0	Y50=	0.0
Y01=	0.10577E 02	Y11=	-0.30500E 00	Y21=	0.97000E-03	Y31=	0.0	Y41=	0.0
Y02=	-C.52960E-03	Y03=	0.0	Y04=	0.0	Y12=	0.59000E-05	Y13=	0.0
Y22=	0.0								

REFERENCES:

(18) T.F. DEUTSCH
 IEEE J. QUANTUM ELECTRONICS QE 3, 419 (1967) (CHEMICAL LASER EMISSION)

FOR SPECTROSCOPIC CONSTANTS SEE HCL 35, REF. (11)

HYDROGEN CHLORIDE (HCL). CHLORIDE ISOTOPE 37.

ENERGY LEVELS IN I/CM

J =	V = 0	V = 1	V = 2	V = 3	V = 4	V = 5	V = 6	V = 7	V = 8
J = 0	0.0	2883.37	5663.92	8340.92	10915.63	13389.01	15761.69	18034.52	20208.31
J = 1	20.85	2904.11	5683.55	8359.96	10934.13	13406.86	15778.95	18051.20	20224.41
J = 2	62.53	2944.58	5722.82	8398.03	10971.00	13442.56	15813.47	18084.56	20256.61
J = 3	125.02	3005.25	5781.68	8455.09	11026.29	13496.07	15865.23	18134.57	20304.98
J = 4	208.28	3086.09	5860.12	8531.14	11099.95	13567.38	15934.19	18201.20	20369.20
J = 5	312.27	3187.05	5958.07	8626.10	11191.95	13656.42	16020.30	18284.41	20449.51
J = 6	436.91	3308.05	6075.46	8739.91	11302.20	13763.13	16123.50	18384.10	20545.74
J = 7	582.13	3449.04	6212.24	8872.51	11430.64	13887.45	16243.72	18500.26	20657.85
J = 8	747.85	3609.92	6368.32	9023.81	11577.21	14029.30	16380.88	18632.77	20785.74
J = 9	933.96	3790.60	6543.59	9193.71	11741.77	14188.57	16534.89	18781.55	20929.32
J = 10	1140.35	3990.94	6737.94	9382.10	11924.24	14365.15	16705.63	18946.49	21088.50
J = 11	1366.89	4210.85	6951.25	9588.87	12124.49	14558.94	16893.00	19127.47	21263.15
J = 12	1613.44	4450.17	7183.38	9813.86	12342.39	14769.80	17096.85	19324.38	21453.14
J = 13	1879.85	4708.76	7434.20	10056.95	12577.80	14997.58	17317.06	19537.05	21658.35
J = 14	2165.97	4986.45	7703.52	10317.96	12830.55	15242.13	17553.46	19765.36	21878.62
J = 15	2471.60	5283.07	7991.18	10596.72	13100.48	15503.28	17805.89	20009.13	22113.77
J = 16	2796.55	5598.43	8297.01	10893.07	13387.42	15780.86	18074.18	20268.19	22363.67
J = 17	3140.65	5932.33	8620.79	11206.79	13691.15	16074.67	18358.14	20542.35	22628.11
J = 18	3503.65	6284.56	8962.31	11537.69	14011.48	16384.50	18657.55	20831.41	22906.88
J = 19	3885.34	6654.90	9321.37	11885.54	14348.20	16710.16	18972.21	21135.16	23199.80
J = 20	4285.47	7043.10	9697.72	12250.11	14701.06	17051.41	19301.01	21453.40	23506.64

HYDROGEN CHLORIDE (HCL). CHLORIDE ISOTOPE 37.

P-BRANCH IN 1/CM

	1 - 0	2 - 1	3 - 2	4 - 3	5 - 4	6 - 5	7 - 6	8 - 7
P(1)	2863.03	2759.81	2657.37	2555.73	2454.88	2354.83	2255.57	2157.11
P(2)	2841.58	2738.97	2637.14	2536.10	2435.86	2336.39	2237.73	2139.84
P(3)	2819.56	2717.57	2616.35	2515.91	2416.27	2317.40	2219.33	2122.04
P(4)	2796.96	2695.59	2594.98	2495.15	2396.12	2297.85	2200.38	2103.68
P(5)	2773.82	2673.07	2573.07	2473.86	2375.43	2277.77	2180.90	2084.79
P(6)	2750.14	2650.01	2550.64	2452.04	2354.22	2257.17	2160.91	2065.41
P(7)	2725.92	2626.42	2527.67	2429.68	2332.48	2236.05	2140.38	2045.48
P(8)	2701.20	2602.31	2504.20	2406.83	2310.25	2214.42	2119.38	2025.08
P(9)	2675.96	2577.72	2480.23	2383.50	2287.53	2192.32	2097.88	2004.20
P(10)	2650.25	2552.64	2455.77	2359.67	2264.32	2169.74	2075.91	1982.83
P(11)	2624.06	2527.09	2430.86	2335.38	2240.66	2146.69	2053.49	1961.03
P(12)	2597.41	2501.07	2405.48	2310.63	2216.55	2123.20	2030.62	1938.77
P(13)	2570.32	2474.63	2379.66	2285.45	2191.99	2099.27	2007.31	1916.09
P(14)	2542.79	2447.75	2353.43	2259.85	2167.03	2074.93	1983.59	1892.99
P(15)	2514.85	2420.45	2326.77	2233.83	2141.64	2050.18	1959.47	1869.49
P(16)	2486.51	2392.76	2299.71	2207.41	2115.86	2025.03	1934.95	1845.59
P(17)	2457.78	2364.68	2272.29	2180.63	2089.51	1999.51	1910.05	1821.32
P(18)	2428.68	2336.22	2244.48	2153.46	2063.19	1973.63	1884.80	1796.70
P(19)	2399.22	2307.41	2216.32	2125.95	2036.30	1947.39	1859.19	1771.71
P(20)	2369.43	2278.27	2187.82	2098.09	2009.10	1920.81	1833.25	1746.40

HYDROGEN CHLORIDE (HCL). CHLORIDE ISOTOPE 37.

R-BRANCH IN 1/CM

	1 - 0	2 - 1	3 - 2	4 - 3	5 - 4	6 - 5	7 - 6	8 - 7
R(0)	2904.11	2799.68	2696.04	2593.20	2491.18	2389.94	2289.51	2189.88
R(1)	2923.73	2818.71	2714.48	2611.05	2508.43	2406.61	2305.61	2205.41
R(2)	2942.72	2837.10	2732.28	2628.26	2525.07	2422.67	2321.10	2220.32
R(3)	2961.07	2854.87	2749.46	2644.86	2541.09	2438.11	2335.97	2234.63
R(4)	2979.77	2871.98	2765.98	2660.81	2556.46	2452.92	2350.22	2248.30
R(5)	2995.79	2888.41	2781.84	2676.10	2571.18	2467.08	2363.80	2261.34
R(6)	3012.14	2904.19	2797.05	2690.73	2585.26	2480.59	2376.76	2273.75
R(7)	3027.79	2919.27	2811.57	2704.70	2598.65	2493.43	2389.05	2285.48
R(8)	3042.75	2933.66	2825.39	2717.96	2611.36	2505.59	2400.66	2296.55
R(9)	3056.98	2947.34	2838.52	2730.54	2623.38	2517.07	2411.60	2306.95
R(10)	3070.50	2960.30	2850.93	2742.39	2634.70	2527.85	2421.84	2316.66
R(11)	3083.29	2972.54	2862.61	2753.53	2645.30	2537.91	2431.38	2325.68
R(12)	3095.32	2984.02	2873.56	2763.95	2655.19	2547.27	2440.20	2333.98
R(13)	3106.59	2994.76	2883.76	2773.61	2664.32	2555.88	2448.30	2341.56
R(14)	3117.10	3004.74	2893.20	2782.53	2672.72	2563.76	2455.67	2348.41
R(15)	3126.83	3013.94	2901.89	2790.70	2680.38	2570.90	2462.30	2354.54
R(16)	3135.78	3022.36	2909.79	2798.08	2687.25	2577.28	2468.17	2359.92
R(17)	3143.92	3029.98	2916.91	2804.69	2693.35	2582.88	2473.27	2364.53
R(18)	3151.25	3036.81	2923.22	2810.51	2698.68	2587.71	2477.61	2368.39
R(19)	3157.76	3042.82	2928.73	2815.53	2703.21	2591.75	2481.18	2371.48

DEUTERIUM CHLORIDE (DCL). CHLORIDE ISOTOPE 35.

LIST OF INPUT DATA

Y10= 0.21449E 04 Y20= -0.27041E 02 Y30= 0.47650E-01 Y40= 0.0 Y50= 0.0
 Y01= 0.54488E 01 Y11= -0.11269E 00 Y21= 0.23839E-03 Y31= 0.0 Y41= 0.0
 Y02= -0.14068E-03 Y03= 0.0 Y04= 0.0 Y12= 0.12145E-05 Y13= 0.0
 Y22= 0.0

REFERENCES:

(18) T.F. DEUTSCH
 IEEE J. QUANTUM ELECTRONICS QE 3., 419 (1967) (CHEMICAL LASER EMISSION)

DUNHAM COEFFICIENTS FOR DCL 35 ARE OBTAINED FROM HCL 35 CONSTANTS
 BY USING THE ISOTOPIC RELATIONSHIP, GIVEN IN REF. (4) .

DEUTERIUM CHLORIDE (DCL). CHLORIDE ISOTOPE 35.

ENERGY LEVELS IN 1/CM

J=	V = 0	V = 1	V = 2	V = 3	V = 4	V = 5	V = 6	V = 7	V = 8
J= 0	0.0	2091.02	4128.37	6112.37	8043.28	9921.39	11747.00	13520.38	15241.82
J= 1	10.78	2101.58	4138.70	6122.47	8053.16	9931.05	11756.45	13529.61	15250.82
J= 2	32.35	2122.69	4159.37	6142.70	8072.95	9950.40	11775.34	13548.07	15258.86
J= 3	64.69	2154.36	4190.36	6173.02	8102.61	9979.39	11803.68	13575.76	15295.89
J= 4	107.79	2196.57	4231.68	6213.45	8142.14	10018.05	11841.46	13612.66	15331.92
J= 5	161.65	2249.30	4283.29	6263.95	8191.54	10066.34	11888.66	13658.76	15376.94
J= 6	226.24	2312.54	4345.20	6324.52	8250.78	10124.27	11945.27	13714.06	15430.92
J= 7	301.54	2386.28	4417.38	6395.14	8319.85	10191.79	12011.25	13778.52	15493.86
J= 8	387.53	2470.48	4499.79	6475.77	8398.71	10268.89	12086.60	13852.12	15565.72
J= 9	484.19	2565.12	4592.42	6566.41	8487.36	10355.55	12171.29	13934.84	15646.48
J= 10	591.48	2670.17	4695.24	6667.01	8585.75	10451.74	12265.29	14026.65	15736.13
J= 11	709.37	2785.60	4808.21	6777.54	8693.86	10557.43	12368.56	14127.53	15834.62
J= 12	837.82	2911.36	4931.30	6897.98	8811.63	10672.56	12481.07	14237.42	15941.91
J= 13	976.80	3047.43	5064.48	7028.27	8939.06	10797.13	12602.79	14356.32	16057.98
J= 14	1126.25	3193.75	5207.69	7168.37	9076.07	10931.07	12733.68	14484.14	16182.77
J= 15	1286.14	3350.28	5360.89	7318.25	9222.64	11074.35	12873.67	14620.88	16316.25
J= 16	1456.40	3516.98	5524.03	7477.85	9378.71	11226.91	13022.74	14766.45	16458.38
J= 17	1637.00	3693.78	5697.05	7647.11	9544.24	11388.71	13180.83	14920.86	16609.09
J= 18	1827.86	3880.63	5879.91	7826.00	9719.16	11559.69	13347.88	15084.00	16768.34
J= 19	2028.93	4077.47	6072.54	8014.43	9903.42	11739.79	13523.83	15255.84	16936.08
J= 20	2240.15	4284.25	6274.88	8212.36	10096.95	11928.95	13708.64	15436.31	17112.23

6-18-54 WACH IN TACH

DEUTERIUM CHLORIDE (DCL). CHLORIDE ISOTOPE 35.

DEUTERIUM CHLORIDE (DCL). CHLORIDE ISOTOPE 35.

P-BRANCH IN 1/CM

	1 - 0	2 - 1	3 - 2	4 - 3	5 - 4	6 - 5	7 - 6	8 - 7
P(1)	2080.23	2026.80	1973.67	1920.80	1868.23	1815.95	1763.94	1712.21
P(2)	2069.23	2016.00	1963.10	1910.46	1858.11	1806.05	1754.26	1702.75
P(3)	2058.00	2005.01	1952.34	1899.92	1847.79	1795.95	1744.39	1693.10
P(4)	2046.57	1993.80	1941.35	1889.16	1837.25	1785.64	1734.30	1683.23
P(5)	2034.92	1982.38	1930.15	1878.19	1826.50	1775.12	1724.00	1673.16
P(6)	2023.06	1970.75	1918.75	1867.02	1815.56	1764.39	1713.50	1662.88
P(7)	2011.00	1958.92	1907.15	1855.64	1804.41	1753.47	1702.80	1652.40
P(8)	1998.74	1946.90	1895.35	1844.08	1793.08	1742.36	1691.92	1641.74
P(9)	1986.29	1934.67	1883.36	1832.30	1781.53	1731.05	1680.83	1630.88
P(10)	1973.64	1922.25	1871.17	1820.35	1769.81	1719.55	1669.55	1619.83
P(11)	1960.80	1909.64	1858.80	1808.20	1757.89	1707.86	1658.09	1608.60
P(12)	1947.77	1896.85	1846.24	1795.88	1745.79	1696.00	1646.45	1597.20
P(13)	1934.56	1883.88	1833.49	1783.36	1733.50	1683.94	1634.63	1585.59
P(14)	1921.18	1870.74	1820.58	1770.69	1721.06	1671.72	1622.64	1573.84
P(15)	1907.61	1857.41	1807.48	1757.82	1708.43	1659.32	1610.47	1561.89
P(16)	1893.88	1843.91	1794.22	1744.79	1695.64	1646.75	1598.14	1549.79
P(17)	1879.98	1830.25	1780.80	1731.60	1682.67	1634.03	1585.64	1537.52
P(18)	1865.92	1816.42	1767.20	1718.25	1669.55	1621.14	1572.98	1525.09
P(19)	1851.70	1802.44	1753.46	1704.73	1656.27	1608.09	1560.17	1512.51
P(20)	1837.32	1788.29	1739.55	1691.06	1642.83	1594.88	1547.20	1499.77

DEUTERIUM CHLORIDE (DCL). CHLORIDE ISOTOPE 35.

R-BRANCH IN 1/CM

	1 - 0	2 - 1	3 - 2	4 - 3	5 - 4	6 - 5	7 - 6	8 - 7
R(0)	2101.58	2047.68	1994.10	1940.79	1887.77	1835.05	1782.61	1730.44
R(1)	2111.91	2057.80	2004.00	1950.47	1897.24	1844.29	1791.63	1739.25
R(2)	2122.01	2067.67	2013.65	1959.91	1906.45	1853.29	1800.41	1747.82
R(3)	2131.88	2077.32	2023.08	1969.12	1915.44	1862.07	1808.97	1756.16
R(4)	2141.51	2086.73	2032.27	1978.10	1924.20	1870.61	1817.30	1764.28
R(5)	2150.89	2095.90	2041.23	1986.83	1932.72	1878.92	1825.40	1772.16
R(6)	2160.04	2104.83	2049.94	1995.33	1941.01	1886.99	1833.25	1779.80
R(7)	2168.94	2113.51	2058.40	2003.57	1949.04	1894.81	1840.87	1787.20
R(8)	2177.58	2121.94	2066.62	2011.59	1956.84	1902.40	1848.23	1794.36
R(9)	2185.98	2130.12	2074.59	2019.34	1964.38	1909.73	1855.36	1801.29
R(10)	2194.11	2138.05	2082.30	2026.84	1971.68	1916.82	1862.24	1807.96
R(11)	2201.99	2145.71	2089.76	2034.09	1978.71	1923.65	1868.86	1814.38
R(12)	2209.60	2153.12	2096.97	2041.08	1985.50	1930.23	1875.24	1820.55
R(13)	2216.95	2160.26	2103.89	2047.80	1992.02	1936.54	1881.35	1826.45
R(14)	2224.03	2167.14	2110.56	2054.27	1998.28	1942.59	1887.20	1832.11
R(15)	2230.84	2173.74	2116.96	2060.46	2004.27	1948.39	1892.80	1837.50
R(16)	2237.38	2180.07	2123.09	2066.39	2010.00	1953.91	1898.12	1842.63
R(17)	2243.63	2186.13	2128.95	2072.05	2015.45	1959.16	1903.18	1847.48
R(18)	2249.62	2191.91	2134.52	2077.42	2020.63	1964.14	1907.96	1852.07
R(19)	2255.31	2197.41	2139.82	2082.52	2025.53	1968.86	1912.48	1856.40

DEUTERIUM CHLORIDE (DCL). CHLORIDE ISOTOPE 37.

LIST OF INPUT DATA

Y10=	0.21418E 04	Y20=	-0.26975E 02	Y30=	0.48964E-01	Y40=	0.0	Y50=	0.0
Y01=	0.54328E 01	Y11=	-0.11228E 00	Y21=	0.25592E-03	Y31=	0.0	Y41=	0.0
Y02=	-0.13973E-03	Y03=	0.0	Y04=	0.0	Y12=	0.11156E-05	Y13=	0.0
Y22=	0.0								

REFERENCES:

(18) T.F. DEUTSCH
 IEEE J. QUANTUM ELECTRONICS QE 3., 419 (1967) (CHEMICAL LASER EMISSION)

DUNHAM COEFFICIENTS FOR DCL 37 ARE OBTAINED FROM HCL 37 CONSTANTS
 BY USING THE ISOTOPIC RELATIONSHIP, GIVEN IN REF. (4).

DEUTERIUM CHLORIDE (DCL). CHLORIDE ISOTOPE 37.

ENERGY LEVELS IN 1/CM

J =	V = 0	V = 1	V = 2	V = 3	V = 4	V = 5	V = 6	V = 7	V = 8
J = 0	0.0	2088.03	4122.54	6103.84	8032.22	9907.97	11731.39	13502.77	15222.39
J = 1	10.75	2098.55	4132.83	6113.91	8042.07	9917.60	11740.80	13511.96	15231.38
J = 2	32.26	2119.61	4153.44	6134.08	8061.80	9936.89	11759.66	13530.38	15249.36
J = 3	64.50	2151.19	4184.35	6164.32	8091.38	9965.82	11787.93	13558.00	15276.33
J = 4	107.48	2193.27	4225.55	6204.64	8130.81	10004.37	11825.60	13594.80	15312.27
J = 5	161.18	2245.85	4277.02	6255.00	8180.07	10052.53	11872.68	13640.79	15357.18
J = 6	225.58	2308.91	4338.74	6315.39	8239.14	10110.29	11929.13	13695.93	15411.02
J = 7	300.66	2382.43	4410.70	6385.80	8308.02	10177.63	11994.93	13760.23	15473.80
J = 8	386.40	2466.39	4492.88	6466.21	8386.67	10254.52	12070.09	13833.64	15545.49
J = 9	482.78	2560.76	4585.25	6556.60	8475.07	10340.95	12154.55	13916.16	15626.06
J = 10	589.76	2665.50	4687.78	6656.91	8573.18	10436.88	12248.30	14007.73	15715.48
J = 11	707.31	2780.60	4800.43	6767.13	8680.98	10542.27	12351.29	14108.34	15813.71
J = 12	835.39	2906.00	4923.18	6887.23	8798.44	10657.11	12463.51	14217.96	15920.74
J = 13	973.96	3041.68	5055.97	7017.16	8925.51	10781.33	12584.91	14336.54	16036.52
J = 14	1122.98	3187.58	5198.77	7156.86	9062.14	10914.91	12715.44	14464.04	16161.00
J = 15	1282.40	3343.66	5351.54	7306.32	9208.31	11057.79	12855.06	14600.42	16294.15
J = 16	1452.18	3509.88	5514.21	7465.47	9363.95	11209.95	13003.74	14745.63	16435.92
J = 17	1632.25	3686.18	5686.74	7634.26	9529.02	11371.30	13161.40	14899.63	16586.25
J = 18	1822.57	3872.50	5869.09	7812.64	9703.46	11541.81	13328.01	15062.35	16745.11
J = 19	2023.07	4068.77	6061.17	8000.54	9887.20	11721.42	13503.50	15233.73	16912.41
J = 20	2233.68	4274.96	6262.93	8197.92	10080.20	11910.07	13687.82	15413.73	17088.13

DEUTERIUM CHLORIDE (DCL). CHLORIDE ISOTOPE 37.

P-BRANCH IN 1/CM

	1 - 0	2 - 1	3 - 2	4 - 3	5 - 4	6 - 5	7 - 6	8 - 7
P(1)	2077.27	2023.98	1971.00	1918.31	1865.89	1813.79	1761.96	1710.43
P(2)	2066.30	2013.22	1960.47	1908.00	1855.80	1803.91	1752.31	1701.00
P(3)	2055.11	2002.26	1949.73	1897.48	1845.51	1793.84	1742.46	1691.36
P(4)	2043.71	1991.08	1938.77	1886.74	1835.00	1783.56	1732.40	1681.52
P(5)	2032.09	1979.70	1927.62	1875.82	1824.30	1773.07	1722.13	1671.48
P(6)	2020.27	1968.10	1916.25	1864.68	1813.39	1762.39	1711.66	1661.25
P(7)	2008.25	1956.31	1904.68	1853.34	1802.27	1751.50	1701.00	1650.80
P(8)	1996.03	1944.32	1892.92	1841.80	1790.96	1740.41	1690.14	1640.16
P(9)	1983.61	1932.13	1880.96	1830.07	1779.45	1729.13	1679.09	1629.33
P(10)	1971.00	1919.75	1868.82	1818.16	1767.77	1717.67	1667.86	1618.33
P(11)	1958.20	1907.18	1856.48	1806.05	1755.90	1706.03	1656.44	1607.13
P(12)	1945.21	1894.43	1843.95	1793.75	1743.83	1694.19	1644.83	1595.75
P(13)	1932.04	1881.50	1831.26	1781.29	1731.59	1682.18	1633.05	1584.20
P(14)	1918.70	1868.39	1818.39	1768.65	1719.19	1670.00	1621.10	1572.48
P(15)	1905.17	1855.10	1805.33	1755.83	1706.59	1657.64	1608.98	1560.58
P(16)	1891.48	1841.65	1792.11	1742.84	1693.84	1645.12	1596.68	1548.52
P(17)	1877.63	1828.03	1778.73	1729.69	1680.93	1632.44	1584.23	1536.29
P(18)	1863.61	1814.24	1765.18	1716.38	1667.84	1619.59	1571.61	1523.91
P(19)	1849.43	1800.31	1751.47	1702.91	1654.61	1606.59	1558.85	1511.37
P(20)	1835.09	1786.21	1737.61	1689.28	1641.21	1593.43	1545.92	1498.68

DEUTERIUM CHLORIDE (DCL), CHLORIDE ISOTOPE 37.

R-BRANCH IN 1/CM

	1 - 0	2 - 1	3 - 2	4 - 3	5 - 4	6 - 5	7 - 6	8 - 7
R(0)	2098.55	2044.81	1991.38	1938.24	1885.38	1832.84	1780.58	1728.61
R(1)	2108.86	2054.89	2001.25	1947.89	1894.82	1842.05	1789.58	1737.40
R(2)	2118.93	2064.74	2010.88	1957.30	1904.02	1851.04	1798.34	1745.95
R(3)	2128.77	2074.36	2020.29	1966.49	1912.99	1859.79	1806.88	1754.27
R(4)	2138.37	2083.75	2029.45	1975.43	1921.72	1868.31	1815.19	1762.38
R(5)	2147.73	2092.89	2038.37	1984.15	1930.22	1876.59	1823.26	1770.23
R(6)	2156.85	2101.79	2047.06	1992.63	1938.48	1884.64	1831.10	1777.87
R(7)	2165.73	2110.45	2055.51	2000.86	1946.50	1892.46	1838.71	1785.26
R(8)	2174.35	2118.86	2063.71	2008.86	1954.29	1900.03	1846.07	1792.41
R(9)	2182.72	2127.03	2071.66	2016.59	1961.81	1907.34	1853.18	1799.32
R(10)	2190.84	2134.93	2079.35	2024.07	1969.09	1914.41	1860.05	1805.98
R(11)	2198.70	2142.58	2086.80	2031.31	1976.12	1921.24	1866.67	1812.40
R(12)	2206.29	2149.97	2093.98	2038.28	1982.89	1927.80	1873.03	1818.56
R(13)	2213.62	2157.09	2100.89	2044.99	1989.39	1934.11	1879.13	1824.46
R(14)	2220.68	2163.96	2107.55	2051.45	1995.65	1940.16	1884.98	1830.11
R(15)	2227.48	2170.55	2113.93	2057.64	2001.63	1945.95	1890.57	1835.50
R(16)	2234.00	2176.86	2120.05	2063.55	2007.35	1951.46	1895.89	1840.62
R(17)	2240.25	2182.91	2125.90	2069.20	2012.80	1956.71	1900.95	1845.48
R(18)	2246.21	2188.67	2131.46	2074.56	2017.96	1961.69	1905.72	1850.07
R(19)	2251.89	2194.15	2136.75	2079.66	2022.87	1966.40	1910.23	1854.39

AC= C*8*E OF
 10 0 50 65 0*

DEUTERIUM CHLORIDE ISOTOPE 37

HYDROGEN BROMIDE (HBR). BROMIDE ISOTOPE 79.

LIST OF INPUT DATA

Y10= 0.26492E 04 Y20= -0.45077E 02 Y30= -0.30000E-01 Y40= 0.0 Y50= 0.0
 Y01= 0.84671E 01 Y11= -0.23226E 00 Y21= 0.37000E-04 Y31= 0.0 Y41= 0.0
 Y02= -0.34720E-03 Y03= 0.80400E-08 Y04= 0.0 Y12= -0.37000E-05 Y13= 0.0
 Y22= 0.0

REFERENCES:

(19) D.H. RANK, U. FINK, T.A. WIGGINS
 J. MOL. SPECTR. 18, 170 (1965) (ABSORPTION)

(18) T.F. DEUTSCH
 IEEE J. QUANTUM ELECTRONICS QE 3., 419 (1967) (CHEMICAL LASER EMISSION)

SPECTROSCOPIC CONSTANTS ARE GIVEN BY:
 (20) H.M. MOULD, W.C. PRICE, G.R. WILKINSON
 SPECTROCHIM. ACTA 16, 479 (1960)

HYDROGEN BROMIDE (HBR). BROMIDE ISOTOPE 79.

ENERGY LEVELS IN 1/CM

J =	V = 0	V = 1	V = 2	V = 3	V = 4	V = 5	V = 6	V = 7	V = 8
J = 0	0.0	2558.96	5027.50	7405.43	9692.59	11888.77	13993.82	16007.54	17929.76
J = 1	16.70	2575.20	5043.27	7420.73	9707.42	11903.15	14007.73	16020.99	17942.74
J = 2	50.09	2607.66	5074.80	7451.34	9737.10	11931.89	14035.55	16047.88	17968.71
J = 3	100.16	2656.34	5122.08	7497.23	9781.60	11975.00	14077.27	16088.21	18007.64
J = 4	166.88	2721.20	5185.09	7558.37	9840.88	12032.43	14132.84	16141.93	18059.50
J = 5	250.21	2802.20	5263.77	7634.74	9914.93	12104.16	14202.25	16209.01	18124.27
J = 6	350.12	2899.33	5358.10	7726.29	10003.59	12190.13	14285.43	16289.42	18201.89
J = 7	466.56	3012.51	5468.03	7832.95	10107.11	12290.30	14382.35	16383.08	18292.31
J = 8	599.46	3141.68	5593.48	7954.69	10225.12	12404.50	14492.93	16489.95	18395.46
J = 9	748.76	3286.79	5734.41	8091.43	10357.67	12532.96	14617.12	16609.95	18511.28
J = 10	914.39	3447.76	5890.71	8243.08	10504.67	12675.31	14754.81	16742.99	18639.68
J = 11	1096.26	3624.51	6062.33	8409.57	10666.04	12831.55	14905.93	16889.01	18780.57
J = 12	1294.28	3816.93	6249.16	8590.81	10841.58	13001.61	15070.40	17047.88	18933.86
J = 13	1508.36	4024.93	6451.10	8786.68	11031.49	13185.36	15248.09	17219.50	19099.44
J = 14	1738.38	4248.42	6668.04	8997.09	11235.36	13382.69	15438.89	17403.78	19277.18
J = 15	1984.23	4487.25	6899.87	9221.90	11453.16	13593.48	15642.68	17600.57	19466.97
J = 16	2245.80	4741.32	7146.45	9460.99	11684.78	13817.61	15859.33	17809.75	19668.68
J = 17	2522.94	5010.50	7407.66	9714.24	11930.05	14054.95	16088.71	18031.17	19882.15
J = 18	2815.51	5294.53	7683.36	9981.49	12188.88	14305.32	16330.66	18264.70	20107.25
J = 19	3123.39	5593.59	7973.39	10262.61	12461.08	14568.61	16585.04	18510.16	20343.80
J = 20	3446.42	5907.21	8277.60	10557.43	12746.50	14844.64	16851.67	18767.40	20591.66

HYDROGEN BROMIDE (HBR). BROMIDE ISOTOPE 79.

P-BRANCH IN 1/CM

	1 - 0	2 - 1	3 - 2	4 - 3	5 - 4	6 - 5	7 - 6	8 - 7
P(1)	2542.26	2452.30	2362.17	2271.85	2181.35	2090.67	1999.81	1908.77
P(2)	2525.11	2435.60	2345.94	2256.09	2166.05	2075.84	1985.44	1894.86
P(3)	2507.50	2418.46	2329.26	2239.87	2150.29	2060.55	1970.62	1880.50
P(4)	2489.46	2400.88	2312.14	2223.23	2134.12	2044.84	1955.36	1865.71
P(5)	2470.98	2382.98	2294.60	2206.14	2117.50	2028.68	1939.68	1850.49
P(6)	2452.08	2364.44	2276.64	2198.65	2100.47	2012.12	1923.58	1834.86
P(7)	2432.77	2345.60	2258.26	2170.74	2083.02	1995.14	1907.07	1818.81
P(8)	2413.04	2326.35	2239.47	2152.41	2065.18	1977.75	1890.15	1802.36
P(9)	2392.92	2306.69	2220.29	2133.69	2046.93	1959.97	1872.83	1785.52
P(10)	2372.40	2286.65	2200.71	2114.59	2028.29	1941.81	1855.14	1768.29
P(11)	2351.50	2266.21	2180.75	2095.10	2009.27	1923.25	1837.06	1750.67
P(12)	2330.22	2245.40	2160.41	2075.23	1989.87	1904.33	1818.61	1732.69
P(13)	2308.57	2224.23	2139.71	2055.00	1970.12	1885.05	1799.80	1714.36
P(14)	2286.55	2202.68	2118.64	2034.40	1949.99	1865.39	1780.61	1695.66
P(15)	2264.18	2180.79	2097.22	2013.46	1929.53	1845.41	1761.10	1676.62
P(16)	2241.46	2158.54	2075.45	1992.17	1908.70	1825.07	1741.23	1657.23
P(17)	2218.39	2135.95	2053.33	1970.54	1887.55	1804.39	1721.04	1637.50
P(18)	2194.99	2113.03	2030.88	1948.57	1866.07	1783.39	1700.52	1617.45
P(19)	2171.24	2089.77	2008.11	1925.27	1844.25	1762.05	1679.66	1597.09
P(20)	2147.17	2066.18	1985.01	1903.65	1822.11	1740.39	1658.49	1576.40

HYDROGEN BROMIDE (HBR). BROMIDE ISOTOPE 79.

R-BRANCH IN 1/CM

	1 - 0	2 - 1	3 - 2	4 - 3	5 - 4	6 - 5	7 - 6	8 - 7
R(0)	2575.20	2+84.30	2393.23	2301.99	2210.56	2118.96	2027.17	1935.20
R(1)	2590.96	2499.60	2408.07	2316.36	2224.47	2132.40	2040.15	1947.71
R(2)	2606.25	2514.41	2422.43	2330.26	2237.90	2145.38	2052.66	1959.76
R(3)	2621.04	2528.75	2436.29	2343.66	2250.83	2157.84	2064.66	1971.30
R(4)	2635.33	2542.57	2449.66	2356.56	2263.29	2169.82	2076.17	1982.34
R(5)	2649.11	2555.90	2462.52	2368.95	2275.20	2181.27	2087.17	1992.88
R(6)	2662.38	2568.70	2474.85	2380.82	2286.61	2192.22	2097.65	2002.89
R(7)	2675.12	2580.98	2486.66	2392.17	2297.49	2202.63	2107.60	2012.38
R(8)	2687.33	2592.73	2497.95	2402.98	2307.84	2212.52	2117.02	2021.33
R(9)	2698.99	2603.92	2508.67	2413.24	2317.64	2221.85	2125.88	2029.73
R(10)	2710.11	2614.57	2518.86	2422.96	2326.88	2230.63	2134.20	2037.58
R(11)	2720.67	2624.66	2528.48	2432.11	2335.56	2238.85	2141.95	2044.86
R(12)	2730.65	2634.17	2537.52	2440.68	2343.67	2246.48	2149.10	2051.55
R(13)	2740.06	2643.11	2545.99	2448.68	2351.20	2253.54	2155.70	2057.68
R(14)	2748.87	2651.45	2553.86	2456.08	2358.12	2259.99	2161.68	2063.19
R(15)	2757.09	2659.20	2561.13	2462.88	2364.45	2265.85	2167.06	2068.11
R(16)	2764.70	2666.34	2567.79	2469.07	2370.17	2271.10	2171.84	2072.40
R(17)	2771.69	2672.86	2573.83	2474.64	2375.26	2275.71	2175.98	2076.07
R(18)	2778.08	2678.75	2579.25	2479.59	2379.73	2279.71	2179.50	2079.11
R(19)	2783.82	2684.01	2584.04	2483.89	2383.56	2283.06	2182.37	2081.50

HYDROGEN BROMIDE (HBR). BROMIDE ISOTOPE 81.

LIST OF INPUT DATA

Y10= 0.26488E 04 Y20= -0.45063E 02 Y30= -0.30000E-01 Y40= 0.0 Y50= 0.0
 Y01= 0.84644E 01 Y11= -0.23216E 00 Y21= 0.37000E-04 Y31= 0.0 Y41= 0.0
 Y02= -C.34700E-03 Y03= 0.80400E-08 Y04= 0.0 Y12= -0.37000E-05 Y13= 0.0
 Y22= 0.0

REFERENCES:

(19) D.H. FANK, U. FINK, T.A. WIGGINS
 J. MUL. SPECTR. 18, 170 (1965) (ABSORPTION)

(18) T.F. DEUTSCH
 IEEE J. QUANTUM ELECTRONICS QE 3., 419 (1967) (CHEMICAL LASER EMISSION)

SPECTROSCOPIC CONSTANTS ARE GIVEN BY:
 (20) H.M. MOULD, W.C. PRICE, G.R. WILKINSON
 SPECTROCHIM. ACTA 16, 479 (1960)

HYDROGEN BROMIDE (HBR). BROMIDE ISOTOPE 81.

ENERGY LEVELS IN I/CM

J =	V = 0	V = 1	V = 2	V = 3	V = 4	V = 5	V = 6	V = 7	V = 8
J = 0	0.0	2558.58	5026.76	7404.37	9691.22	11887.14	13991.93	16005.45	17927.47
J = 1	16.70	2574.81	5042.52	7419.66	9706.05	11901.50	14005.84	16018.89	17940.45
J = 2	50.08	2607.27	5074.04	7450.25	9735.72	11930.24	14033.65	16045.77	17966.41
J = 3	100.13	2655.92	5121.31	7496.13	9780.21	11973.34	14075.36	16086.09	18005.34
J = 4	166.83	2720.76	5184.30	7557.26	9839.48	12030.75	14130.91	16139.79	18057.18
J = 5	250.14	2801.75	5262.96	7633.61	9913.50	12102.46	14200.30	16206.86	18121.93
J = 6	350.02	2898.84	5357.26	7725.12	10002.23	12188.41	14283.46	16287.24	18199.53
J = 7	466.42	3011.98	5467.16	7831.76	10105.62	12288.55	14380.35	16380.88	18289.93
J = 8	599.28	3141.12	5592.57	7953.46	10223.60	12402.81	14490.90	16487.72	18393.05
J = 9	748.53	3286.19	5733.45	8090.16	10356.12	12531.14	14615.05	16607.68	18508.84
J = 10	914.11	3447.11	5889.72	8241.77	10503.08	12673.45	14752.71	16740.70	18637.21
J = 11	1095.93	3623.80	6061.29	8408.21	10664.40	12829.65	14903.80	16886.67	18778.07
J = 12	1293.89	3816.16	6248.06	8589.40	10839.99	12999.66	15068.22	17045.50	18931.32
J = 13	1507.90	4024.11	6449.94	8785.21	11029.74	13183.35	15245.86	17217.08	19096.84
J = 14	1737.85	4247.52	6666.82	8995.55	11233.55	13380.63	15436.61	17401.30	19274.55
J = 15	1983.63	4486.29	6898.57	9220.30	11451.30	13591.36	15640.34	17598.04	19464.29
J = 16	2245.11	4740.28	7145.08	9459.32	11682.84	13815.43	15856.93	17807.16	19665.94
J = 17	2522.17	5009.38	7406.22	9712.50	11928.06	14052.71	16086.25	18028.54	19879.36
J = 18	2814.66	5293.43	7681.83	9979.68	12186.81	14303.02	16328.13	18262.00	20104.40
J = 19	3122.44	5592.29	7971.78	10260.71	12458.93	14566.23	16582.45	18507.40	20340.89
J = 20	3445.37	5905.82	8275.91	10555.45	12744.27	14842.18	16849.01	18764.57	20588.70

NIST-JANIS

HYDROGEN BROMIDE (HBR) BROMIDE ISOTOPE 81

HYDROGEN BROMIDE (HBR). BROMIDE ISOTOPE 81.

P-BRANCH IN I/CM

	1 - 0	2 - 1	3 - 2	4 - 3	5 - 4	6 - 5	7 - 6	8 - 7
P(1)	2541.89	2451.95	2361.85	2271.56	2181.08	2090.43	1999.61	1908.59
P(2)	2524.73	2435.25	2345.62	2255.80	2165.78	2075.59	1985.23	1894.68
P(3)	2507.14	2418.12	2328.94	2239.59	2150.04	2060.31	1970.42	1880.32
P(4)	2489.10	2400.55	2311.84	2222.95	2133.86	2044.61	1955.18	1865.54
P(5)	2470.63	2382.55	2294.30	2205.87	2117.25	2028.46	1939.49	1850.33
P(6)	2451.73	2364.12	2276.34	2188.38	2100.22	2011.89	1923.39	1834.69
P(7)	2432.42	2345.28	2257.96	2170.47	2082.79	1994.92	1906.89	1818.65
P(8)	2412.70	2326.04	2239.19	2152.16	2064.95	1977.54	1889.98	1802.21
P(9)	2392.58	2306.39	2220.01	2133.44	2046.70	1959.77	1872.66	1785.37
P(10)	2372.08	2286.34	2200.44	2114.35	2028.06	1941.61	1854.97	1768.14
P(11)	2351.18	2265.92	2180.48	2094.86	2009.05	1923.06	1836.90	1750.54
P(12)	2329.91	2245.12	2160.15	2075.00	1989.66	1904.14	1818.45	1732.56
P(13)	2308.27	2223.95	2139.46	2054.78	1969.91	1884.87	1799.65	1714.23
P(14)	2286.26	2202.41	2118.39	2034.19	1949.80	1865.22	1780.48	1695.54
P(15)	2263.90	2180.53	2096.98	2013.25	1929.34	1845.24	1760.96	1676.50
P(16)	2241.18	2158.29	2075.22	1991.97	1908.52	1824.91	1741.11	1657.12
P(17)	2218.11	2135.70	2053.11	1970.34	1887.37	1804.23	1720.91	1637.40
P(18)	2194.72	2112.79	2030.67	1948.38	1865.90	1783.24	1700.40	1617.36
P(19)	2170.99	2089.54	2007.91	1926.09	1844.09	1761.91	1679.55	1597.00
P(20)	2146.92	2065.95	1984.81	1903.48	1821.96	1740.26	1658.39	1576.32

HYDROGEN BROMIDE (HBR). BROMIDE ISOTOPE 81.

R-BRANCH IN 1/CM

	1 - 0	2 - 1	3 - 2	4 - 3	5 - 4	6 - 5	7 - 6	8 - 7
R(0)	2574.81	2483.94	2392.90	2301.69	2210.28	2118.70	2026.95	1935.00
R(1)	2590.57	2499.23	2407.73	2316.06	2224.19	2132.15	2039.94	1947.53
R(2)	2605.85	2514.05	2422.09	2329.95	2237.62	2145.11	2052.44	1959.56
R(3)	2620.64	2528.37	2435.95	2343.34	2250.54	2157.57	2064.44	1971.09
R(4)	2634.92	2542.19	2449.31	2356.24	2262.98	2169.55	2075.94	1982.14
R(5)	2648.70	2555.51	2462.16	2358.63	2274.91	2181.01	2086.94	1992.69
R(6)	2661.96	2568.32	2474.50	2380.50	2286.31	2191.95	2097.41	2002.69
R(7)	2674.70	2580.59	2486.30	2391.84	2297.19	2202.35	2107.37	2012.18
R(8)	2686.91	2592.34	2497.59	2402.66	2307.54	2212.24	2116.78	2021.12
R(9)	2698.58	2603.53	2508.31	2412.92	2317.33	2221.58	2125.64	2029.53
R(10)	2709.69	2614.18	2518.49	2422.63	2326.57	2230.35	2133.96	2037.37
R(11)	2720.24	2624.26	2528.11	2431.77	2335.26	2238.57	2141.71	2044.64
R(12)	2730.22	2633.77	2537.15	2440.34	2343.36	2246.20	2148.86	2051.34
R(13)	2739.63	2642.71	2545.61	2448.34	2350.89	2253.25	2155.45	2057.46
R(14)	2748.44	2651.05	2553.48	2455.75	2357.81	2259.71	2161.44	2062.98
R(15)	2756.65	2658.79	2560.75	2462.54	2364.14	2265.57	2166.82	2067.89
R(16)	2764.27	2665.94	2567.42	2468.74	2369.86	2270.82	2171.60	2072.20
R(17)	2771.26	2672.45	2573.46	2474.30	2374.95	2275.43	2175.75	2075.86
R(18)	2777.64	2678.35	2578.88	2479.24	2379.42	2279.43	2179.27	2078.89
R(19)	2783.38	2683.61	2583.67	2483.55	2383.26	2282.78	2182.13	2081.30

DEUTERIUM BROMIDE (DBR). BROMIDE ISOTOPE 79.

LIST OF INPUT DATA

Y10=	0.18858E 04	Y20=	-0.22840E 02	Y30=	-0.10000E-01	Y40=	0.0	Y50=	0.0
Y01=	0.42901E 01	Y11=	-0.83770E-01	Y21=	0.0	Y31=	0.0	Y41=	0.0
Y02=	-0.89140E-04	Y03=	0.0	Y04=	0.0	Y12=	-0.68000E-06	Y13=	0.0
Y22=	0.0								

REFERENCES:

(18) T.F. DEUTSCH
 IEEE J. QUANTUM ELECTRONICS QE 3., 419 (1967) (CHEMICAL LASER EMISSION)

SPECTROSCOPIC CONSTANTS ARE GIVEN BY:
 (20) H.M. MOULD, W.C. PRICE, G.R. WILKINSON
 SPECTROCHIM. ACTA 16, 479 (1960)
 INPUT DATA ARE CALCULATED VALUES.

DEUTERIUM BROMIDE (DBR). BROMIDE ISOTOPE 79.

ENERGY LEVELS IN 1/CM

J =	V = 0	V = 1	V = 2	V = 3	V = 4	V = 5	V = 6	V = 7	V = 8
J = 0	0.0	1840.05	3634.32	5382.76	7085.32	8741.93	10352.53	11917.05	13435.45
J = 1	8.50	1848.38	3642.48	5390.75	7093.14	8749.58	10360.01	11924.37	13442.60
J = 2	25.49	1865.03	3658.80	5406.73	7108.79	8764.90	10374.99	11939.02	13456.91
J = 3	50.97	1890.01	3683.27	5430.70	7132.26	8787.86	10397.45	11960.98	13478.36
J = 4	84.93	1923.30	3715.89	5462.65	7163.54	8818.47	10427.39	11990.25	13506.96
J = 5	127.37	1964.90	3756.66	5502.58	7202.53	8856.72	10464.81	12026.82	13542.70
J = 6	178.27	2014.80	3805.55	5550.46	7249.50	8902.59	10509.67	12070.68	13585.55
J = 7	237.62	2072.98	3862.55	5606.30	7304.16	8956.08	10561.98	12121.82	13635.52
J = 8	305.41	2139.42	3927.66	5670.06	7366.59	9017.16	10621.72	12180.21	13692.57
J = 9	381.62	2214.12	4000.85	5741.74	7436.75	9085.82	10688.87	12245.86	13756.71
J = 10	466.23	2297.05	4082.09	5821.31	7514.64	9162.03	10763.41	12318.71	13827.88
J = 11	559.21	2388.19	4171.39	5908.76	7600.25	9245.79	10845.32	12398.77	13906.10
J = 12	660.55	2487.51	4268.70	6004.05	7693.52	9337.05	10934.56	12486.01	13991.32
J = 13	770.22	2595.00	4374.00	6107.17	7794.46	9435.80	11031.13	12580.39	14083.52
J = 14	888.19	2710.61	4487.26	6218.08	7903.02	9542.00	11134.98	12681.89	14182.66
J = 15	1014.43	2834.33	4608.45	6336.75	8019.16	9655.63	11246.08	12790.46	14288.72
J = 16	1148.91	2966.12	4737.55	6463.15	8142.88	9776.65	11364.41	12906.11	14401.66
J = 17	1291.59	3105.94	4874.51	6597.26	8274.12	9905.03	11489.93	13028.76	14521.46
J = 18	1442.44	3253.75	5019.30	6739.01	8412.84	10040.72	11622.59	13158.39	14648.05
J = 19	1601.42	3409.53	5171.87	6888.38	8559.00	10183.68	11762.35	13294.95	14781.41
J = 20	1768.49	3573.23	5332.19	7045.33	8712.58	10333.89	11909.18	13438.41	14921.50

DEUTERIUM BROMIDE (DBR). BROMIDE ISOTOPE 79.

P-BRANCH IN 1/CM

	1 - 0	2 - 1	3 - 2	4 - 3	5 - 4	6 - 5	7 - 6	8 - 7
P(1)	1831.55	1785.95	1740.29	1694.57	1648.79	1602.95	1557.04	1511.08
P(2)	1822.89	1777.45	1731.95	1686.41	1640.79	1595.11	1549.38	1503.58
P(3)	1814.06	1768.79	1723.47	1678.09	1632.64	1587.13	1541.57	1495.93
P(4)	1805.08	1759.97	1714.81	1669.61	1624.32	1578.98	1533.58	1488.12
P(5)	1795.93	1750.99	1706.00	1660.96	1615.85	1570.67	1525.44	1480.15
P(6)	1786.63	1741.86	1697.04	1652.16	1607.22	1562.21	1517.14	1472.02
P(7)	1777.17	1732.57	1687.91	1643.20	1598.43	1553.59	1508.69	1463.74
P(8)	1767.57	1723.13	1678.64	1634.10	1589.49	1544.82	1500.09	1455.30
P(9)	1757.80	1713.53	1669.21	1624.84	1580.41	1535.90	1491.34	1446.72
P(10)	1747.90	1703.80	1659.65	1615.45	1571.18	1526.84	1482.45	1438.00
P(11)	1737.84	1693.90	1649.92	1605.89	1561.79	1517.62	1473.39	1429.11
P(12)	1727.64	1683.87	1640.06	1596.19	1552.26	1508.27	1464.21	1420.09
P(13)	1717.29	1673.70	1630.06	1586.36	1542.59	1498.76	1454.88	1410.93
P(14)	1706.81	1663.38	1619.91	1576.38	1532.79	1489.13	1445.41	1401.63
P(15)	1696.19	1652.93	1609.63	1566.27	1522.84	1479.35	1435.80	1392.19
P(16)	1685.42	1642.33	1599.20	1556.01	1512.75	1469.43	1426.05	1382.61
P(17)	1674.53	1631.61	1588.64	1545.62	1502.54	1459.39	1416.18	1372.90
P(18)	1663.50	1620.76	1577.96	1535.11	1492.19	1449.21	1406.17	1363.07
P(19)	1652.33	1609.77	1567.14	1524.46	1481.71	1438.90	1396.04	1353.10
P(20)	1641.04	1598.64	1556.19	1513.68	1471.10	1428.46	1385.77	1343.01

DEUTERIUM BROMIDE (DBR). BROMIDE ISOTOPE 79.

R-BRANCH IN 1/CM

	1 - 0	2 - 1	3 - 2	4 - 3	5 - 4	6 - 5	7 - 6	8 - 7
R(0)	1848.38	1802.43	1756.42	1710.38	1664.26	1618.08	1571.84	1525.54
R(1)	1856.53	1810.43	1764.26	1718.05	1671.76	1625.41	1579.01	1532.54
R(2)	1864.52	1818.24	1771.90	1725.52	1679.07	1632.55	1585.98	1539.34
R(3)	1872.34	1825.88	1779.38	1732.84	1686.21	1639.54	1592.79	1545.99
R(4)	1879.97	1833.35	1786.69	1739.97	1693.18	1646.34	1599.42	1552.45
R(5)	1887.43	1840.65	1793.80	1746.92	1699.97	1652.95	1605.87	1558.74
R(6)	1894.71	1847.75	1800.75	1753.70	1706.58	1659.39	1612.14	1564.84
R(7)	1901.80	1854.68	1807.51	1760.29	1713.00	1665.64	1618.23	1570.76
R(8)	1908.71	1861.42	1814.09	1766.70	1719.23	1671.71	1624.13	1576.49
R(9)	1915.43	1867.97	1820.46	1772.90	1725.28	1677.59	1629.84	1582.03
R(10)	1921.96	1874.34	1826.66	1778.94	1731.14	1683.29	1635.37	1587.39
R(11)	1928.30	1880.51	1832.67	1784.77	1736.80	1688.78	1640.69	1592.54
R(12)	1934.45	1886.48	1838.47	1790.41	1742.28	1694.08	1645.82	1597.51
R(13)	1940.40	1892.26	1844.08	1795.85	1747.54	1699.18	1650.76	1602.27
R(14)	1946.14	1897.83	1849.49	1801.09	1752.61	1704.08	1655.48	1606.83
R(15)	1951.69	1903.21	1854.70	1806.13	1757.49	1708.79	1660.02	1611.20
R(16)	1957.03	1908.39	1859.71	1810.96	1762.15	1713.28	1664.34	1615.35
R(17)	1962.16	1913.36	1864.50	1815.58	1766.60	1717.56	1668.46	1619.29
R(18)	1967.09	1918.12	1869.09	1820.00	1770.84	1721.63	1672.36	1623.03
R(19)	1971.81	1922.66	1873.46	1824.20	1774.89	1725.50	1676.05	1626.55

DEUTERIUM BROMIDE (DBR). BROMIDE ISOTOPE 81.

LIST OF INPUT DATA

Y10=	0.18852E 04	Y20=	-0.22830E 02	Y30=	-0.10000E-01	Y40=	0.0	Y50=	0.0
Y01=	0.42875E 01	Y11=	-0.83690E-01	Y21=	0.0	Y31=	0.0	Y41=	0.0
Y02=	-0.89030E-04	Y03=	0.0	Y04=	0.0	Y12=	0.0	Y13=	0.0
Y22=	C.0								

REFERENCES:

(18) T.F. DEUTSCH
 IEEE J. QUANTUM ELECTRONICS QE 3., 419 (1967) (CHEMICAL LASER EMISSION)

SPECTROSCOPIC CONSTANTS ARE GIVEN BY:
 (20) H.M. MOULD, W.C. PRICE, G.R. WILKINSON
 SPECTROCHIM. ACTA 16, 479 (1960)
 INPUT DATA ARE CALCULATED VALUES.

DEUTERIUM BROMIDE (DBR). BROMIDE ISOTOPE 81.

ENERGY LEVELS IN 1/CM

J =	V = 0	V = 1	V = 2	V = 3	V = 4	V = 5	V = 6	V = 7	V = 8
J = 0	0.0	1839.49	3633.22	5381.15	7083.20	8739.33	10349.47	11913.56	13431.53
J = 1	8.49	1847.81	3641.37	5389.13	7091.02	8746.98	10356.95	11920.87	13438.68
J = 2	25.47	1864.46	3657.69	5405.11	7106.66	8762.29	10371.92	11935.51	13452.98
J = 3	50.93	1889.42	3682.15	5429.07	7130.12	8785.24	10394.37	11957.46	13474.43
J = 4	84.88	1922.69	3714.74	5461.00	7161.38	8815.83	10424.29	11986.71	13503.01
J = 5	127.29	1964.27	3755.49	5500.90	7200.44	8854.06	10461.69	12023.27	13538.73
J = 6	178.16	2014.13	3804.35	5548.76	7247.30	8899.91	10506.54	12067.11	13581.57
J = 7	237.48	2072.28	3861.32	5604.56	7301.93	8953.37	10558.82	12118.22	13631.51
J = 8	305.23	2138.69	3926.39	5668.29	7364.32	9014.42	10618.54	12176.60	13688.55
J = 9	381.39	2213.34	3999.54	5739.93	7434.46	9083.05	10685.66	12242.21	13752.66
J = 10	465.94	2296.23	4080.75	5819.47	7512.32	9159.24	10760.17	12315.05	13823.82
J = 11	558.87	2387.31	4170.00	5906.88	7597.88	9242.96	10842.05	12395.10	13902.02
J = 12	660.16	2486.59	4267.26	6002.13	7691.13	9334.20	10931.29	12482.32	13987.23
J = 13	769.76	2594.02	4372.52	6105.21	7792.04	9432.93	11027.84	12576.70	14079.44
J = 14	887.66	2709.57	4485.73	6216.07	7900.55	9539.11	11131.67	12678.19	14178.59
J = 15	1013.83	2833.23	4606.88	6334.71	8016.68	9652.73	11242.78	12786.78	14284.67
J = 16	1148.23	2964.95	4735.92	6461.08	8140.38	9773.74	11361.11	12902.44	14397.65
J = 17	1290.83	3104.71	4872.83	6595.15	8271.59	9902.11	11486.64	13025.12	14517.48
J = 18	1441.60	3252.46	5017.58	6736.88	8410.31	10037.82	11619.34	13154.80	14644.15
J = 19	1600.49	3408.17	5170.10	6886.23	8556.48	10180.80	11759.14	13291.43	14777.60
J = 20	1767.47	3571.80	5330.39	7043.16	8710.07	10331.05	11906.03	13434.97	14917.80

DEUTERIUM BROMIDE (DBR). BROMIDE ISOTOPE 81.

P-BRANCH IN 1/CM

	1 - 0	2 - 1	3 - 2	4 - 3	5 - 4	6 - 5	7 - 6	8 - 7
P(1)	1831.00	1785.41	1739.78	1694.07	1648.31	1602.49	1556.61	1510.66
P(2)	1822.34	1776.92	1731.45	1685.91	1640.32	1594.66	1548.95	1503.17
P(3)	1813.52	1768.27	1722.96	1677.59	1632.17	1586.68	1541.14	1495.52
P(4)	1804.54	1759.46	1714.32	1669.12	1623.87	1578.54	1533.16	1487.71
P(5)	1795.40	1750.48	1705.51	1660.48	1615.39	1570.23	1525.02	1479.74
P(6)	1786.11	1741.35	1696.55	1651.68	1606.76	1561.78	1516.73	1471.62
P(7)	1776.66	1732.07	1687.44	1642.74	1597.98	1553.16	1508.29	1463.34
P(8)	1767.05	1722.64	1678.17	1633.64	1589.05	1544.40	1499.69	1454.91
P(9)	1757.30	1713.05	1668.75	1624.39	1579.96	1535.48	1490.94	1446.33
P(10)	1747.40	1703.32	1659.18	1614.99	1570.73	1526.41	1482.04	1437.60
P(11)	1737.35	1693.44	1649.47	1605.44	1561.36	1517.21	1473.00	1428.73
P(12)	1727.16	1683.41	1639.61	1595.75	1551.84	1507.85	1463.81	1419.70
P(13)	1716.83	1673.25	1629.62	1585.92	1542.17	1498.35	1454.48	1410.54
P(14)	1706.35	1662.94	1619.48	1575.96	1532.38	1488.73	1445.02	1401.25
P(15)	1695.74	1652.50	1609.20	1565.84	1522.43	1478.95	1435.41	1391.80
P(16)	1685.00	1641.92	1598.79	1555.60	1512.35	1469.04	1425.67	1382.23
P(17)	1674.12	1631.21	1588.25	1545.23	1502.14	1459.00	1415.80	1372.53
P(18)	1663.11	1620.37	1577.57	1534.71	1491.80	1448.82	1405.79	1362.68
P(19)	1651.97	1609.40	1566.78	1524.09	1481.34	1438.53	1395.66	1352.73
P(20)	1640.70	1598.30	1555.84	1513.32	1470.74	1428.09	1385.39	1342.63

DEUTERIUM BROMIDE (DBR). BROMIDE ISOTOPE 81.

	1 - 0	2 - 1	3 - 2	4 - 3	5 - 4	6 - 5	7 - 6	8 - 7
R(0)	1847.81	1801.89	1755.91	1709.87	1663.78	1617.62	1571.40	1525.12
R(1)	1855.96	1809.88	1763.74	1717.53	1671.27	1624.94	1578.56	1532.11
R(2)	1863.95	1817.69	1771.38	1725.01	1678.58	1632.08	1585.54	1538.92
R(3)	1871.76	1825.33	1778.85	1732.31	1685.71	1639.05	1592.34	1545.55
R(4)	1879.39	1832.80	1786.15	1739.45	1692.68	1645.86	1598.97	1552.02
R(5)	1886.84	1840.08	1793.27	1746.40	1699.47	1652.48	1605.42	1558.30
R(6)	1894.12	1847.19	1800.21	1753.17	1706.07	1658.91	1611.69	1564.40
R(7)	1901.21	1854.11	1806.97	1759.76	1712.49	1665.16	1617.78	1570.32
R(8)	1908.12	1860.85	1813.54	1766.16	1718.73	1671.23	1623.68	1576.06
R(9)	1914.84	1867.41	1819.93	1772.38	1724.79	1677.12	1629.40	1581.61
R(10)	1921.37	1873.77	1826.12	1778.41	1730.65	1682.81	1634.93	1586.97
R(11)	1927.71	1879.95	1832.14	1784.25	1736.32	1688.32	1640.27	1592.14
R(12)	1933.86	1885.93	1837.95	1789.90	1741.80	1693.63	1645.41	1597.12
R(13)	1939.81	1891.71	1843.56	1795.34	1747.07	1698.74	1650.35	1601.89
R(14)	1945.57	1897.30	1848.99	1800.61	1752.17	1703.67	1655.11	1606.48
R(15)	1951.13	1902.69	1854.21	1805.66	1757.05	1708.39	1659.66	1610.87
R(16)	1956.48	1907.88	1859.23	1810.51	1761.74	1712.90	1664.01	1615.05
R(17)	1961.63	1912.87	1864.05	1815.16	1766.23	1717.22	1668.16	1619.03
R(18)	1966.57	1917.64	1868.65	1819.60	1770.49	1721.32	1672.09	1622.80
R(19)	1971.31	1922.21	1873.06	1823.84	1774.57	1725.23	1675.83	1626.37

CARBON MONOXIDE (CO).

LIST OF INPUT DATA

Y10=	0.21698E 04	Y20=	-0.13292E 02	Y30=	0.10820E-01	Y40=	0.57200E-04	Y50=	0.0
Y01=	0.19314E 01	Y11=	-0.17520E-01	Y21=	0.29600E-05	Y31=	0.0	Y41=	0.0
Y02=	-0.61800E-05	Y03=	0.0	Y04=	0.0	Y12=	-0.17600E-08	Y13=	0.0
Y22=	0.0								

REFERENCES:

- (21) W.S. BENEDICT, R. HERMAN, G.E. MOORE, S. SILVERMAN
ASTROPHYS. J. 135, 277 (1962) (ABSORPTION)
 - (22) R.A. MC FARLANE, J.A. HOWE
PHYS. LETTERS 19, 208 (1965) (LASER EMISSION)
 - (23) C.K.N. PATEL
PHYS. REV. 141, 71 (1966) (LASER EMISSION)
 - (6) M.A. POLLACK
APPL. PHYS. LETTERS 8, 237 (1966) (CHEMICAL LASER EMISSION)
- SPECTROSCOPIC CONSTANTS ARE TAKEN FROM REF. (21)
TOGETHER WITH CORRECTIONS GIVEN BY:
(24) C.K.N. PATEL
APPL. PHYS. LETTERS 7, 246 (1965)

CARBON MONOXIDE (CO).

ENERGY LEVELS IN 1/CM

J=	C	V = C	V = 1	V = 2	V = 3	V = 4	V = 5	V = 6	V = 7	V = 8
J=	0	0.0	2143.27	4260.05	6350.42	8414.44	10452.18	12463.72	14449.13	16408.47
J=	1	3.84	2147.08	4263.82	6354.15	8418.14	10455.84	12467.35	14452.72	16412.03
J=	2	11.54	2154.70	4271.37	6361.63	8425.55	10463.19	12474.62	14459.92	16419.16
J=	3	23.07	2166.13	4282.69	6372.85	8436.66	10474.20	12485.52	14470.72	16429.85
J=	4	38.45	2181.37	4297.79	6387.81	8451.48	10488.87	12500.06	14485.12	16444.11
J=	5	57.67	2200.42	4316.66	6406.51	8470.01	10507.22	12518.23	14503.12	16461.94
J=	6	80.74	2223.28	4339.31	6428.95	8492.23	10529.24	12540.04	14524.71	16483.32
J=	7	107.65	2249.94	4365.73	6455.12	8518.16	10554.92	12565.48	14549.91	16508.28
J=	8	138.40	2280.41	4395.91	6485.02	8547.79	10584.27	12594.55	14578.70	16536.78
J=	9	172.99	2314.68	4429.88	6518.67	8581.12	10617.29	12627.25	14611.08	16568.85
J=	10	211.42	2352.76	4467.60	6556.05	8618.14	10653.96	12663.58	14647.06	16604.48
J=	11	253.68	2394.64	4509.10	6597.16	8658.88	10694.30	12703.54	14686.63	16643.67
J=	12	299.78	2440.32	4554.36	6642.00	8703.29	10738.30	12747.11	14729.79	16686.41
J=	13	349.72	2489.80	4603.38	6690.57	8751.40	10785.96	12794.32	14776.54	16732.70
J=	14	403.48	2543.08	4656.17	6742.86	8803.21	10837.27	12845.14	14826.88	16782.55
J=	15	461.08	2600.15	4712.71	6798.88	8858.70	10892.24	12899.59	14880.80	16835.95
J=	16	522.50	2661.01	4773.02	6858.63	8917.89	10950.87	12957.65	14938.30	16892.89
J=	17	587.75	2725.66	4837.07	6922.08	8980.75	11013.14	13019.33	14999.39	16953.38
J=	18	656.82	2794.10	4904.88	6989.27	9047.31	11079.06	13084.62	15064.05	17017.42
J=	19	729.71	2866.33	4976.44	7060.16	9117.54	11148.63	13153.52	15132.29	17084.99
J=	20	806.42	2942.34	5051.75	7134.77	9191.45	11221.84	13226.03	15204.09	17156.10
J=	21	886.95	3022.12	5130.80	7213.09	9269.03	11298.68	13302.14	15279.48	17230.75
J=	22	971.28	3105.68	5213.59	7295.11	9350.28	11379.16	13381.86	15358.42	17308.92
J=	23	1059.42	3193.01	5300.12	7380.83	9435.20	11463.28	13465.17	15440.93	17390.62
J=	24	1151.36	3284.12	5390.39	7470.26	9523.79	11551.03	13552.08	15526.99	17475.85
J=	25	1247.11	3378.99	5484.38	7563.38	9616.03	11642.39	13642.57	15616.61	17564.60
J=	26	1346.65	3477.62	5582.11	7660.19	9711.93	11737.39	13736.65	15709.79	17656.87
J=	27	1449.99	3580.01	5683.55	7760.69	9811.48	11836.00	13834.32	15806.51	17752.64
J=	28	1557.12	3686.16	5788.71	7864.88	9914.69	11938.22	13935.56	15906.77	17851.93
J=	29	1668.03	3796.05	5897.59	7972.73	10021.54	12044.05	14040.38	16010.58	17954.72
J=	30	1782.72	3909.69	6010.19	8084.27	10132.03	12153.50	14148.77	16117.93	18061.02

CARBON MONOXIDE (CO).

ENERGY LEVELS IN 1/CM (CONTINUE)

	V = 9	V = 10	V = 11	V = 12	V = 13	V = 14	V = 15	V = 16
J= 0	18341.83	20249.29	22130.92	23986.80	25817.03	27621.66	29400.80	31154.52
J= 1	18345.35	20252.77	22134.38	23990.22	25820.41	27625.01	29404.12	31157.80
J= 2	18352.41	20259.77	22141.30	23997.07	25827.19	27631.72	29410.76	31164.38
J= 3	18363.00	20270.25	22151.68	24007.35	25837.36	27641.79	29420.72	31174.23
J= 4	18377.12	20284.23	22165.52	24021.05	25850.93	27655.21	29434.00	31187.38
J= 5	18394.77	20301.71	22182.82	24038.18	25867.88	27671.99	29450.61	31203.80
J= 6	18415.95	20322.68	22203.58	24058.73	25888.22	27692.12	29470.53	31223.52
J= 7	18440.65	20347.13	22227.79	24082.70	25911.95	27715.61	29493.77	31246.51
J= 8	18468.88	20375.09	22255.46	24110.09	25939.05	27742.44	29520.32	31272.79
J= 9	18500.64	20406.53	22286.59	24140.91	25969.56	27772.63	29550.20	31302.35
J= 10	18535.92	20441.46	22321.17	24175.14	26003.44	27806.16	29583.38	31335.18
J= 11	18574.72	20479.88	22359.21	24212.79	26040.71	27843.04	29619.88	31371.30
J= 12	18617.04	20521.78	22400.69	24253.85	26081.35	27883.27	29659.69	31410.69
J= 13	18662.89	20567.16	22445.63	24298.33	26125.38	27926.84	29702.81	31453.36
J= 14	18712.25	20616.04	22494.01	24346.22	26172.79	27973.76	29749.23	31499.30
J= 15	18765.11	20668.38	22545.83	24397.52	26223.56	28024.01	29798.96	31548.50
J= 16	18821.50	20724.21	22601.10	24452.24	26277.71	28077.61	29852.00	31600.99
J= 17	18881.39	20783.51	22659.80	24510.35	26335.24	28134.54	29908.34	31656.73
J= 18	18944.80	20846.29	22721.96	24571.88	26396.13	28194.80	29967.98	31715.74
J= 19	19011.71	20912.54	22787.54	24636.79	26460.39	28258.40	30030.91	31778.01
J= 20	19082.13	20982.25	22856.55	24705.11	26528.00	28325.31	30097.13	31843.54
J= 21	19156.04	21055.43	22929.00	24776.82	26598.98	28395.56	30166.65	31912.32
J= 22	19233.44	21132.06	23004.87	24851.92	26673.32	28469.13	30239.45	31984.35
J= 23	19314.34	21212.16	23084.16	24930.41	26751.00	28546.02	30315.53	32059.63
J= 24	19398.73	21295.71	23166.88	25012.29	26832.04	28626.21	30394.89	32138.16
J= 25	19486.61	21382.71	23253.00	25097.54	26916.43	28709.73	30477.54	32219.93
J= 26	19577.96	21473.16	23342.54	25186.18	27004.15	28796.55	30563.45	32304.93
J= 27	19672.79	21567.05	23435.49	25278.18	27095.21	28886.67	30652.63	32393.17
J= 28	19771.11	21664.38	23531.85	25373.56	27189.62	28980.09	30745.07	32484.65
J= 29	19872.88	21765.15	23631.60	25472.30	27287.35	29076.81	30840.78	32579.34
J= 30	19978.13	21869.34	23734.75	25574.41	27388.40	29176.82	30939.75	32677.26

CARBON MONOXIDE (CO).

P-BRANCH IN 1/CM

	1 - 0	2 - 1	3 - 2	4 - 3	5 - 4	6 - 5	7 - 6	8 - 7
P(1)	2139.43	2112.97	2086.60	2060.29	2034.04	2007.88	1981.78	1955.75
P(2)	2135.55	2109.11	2082.79	2056.51	2030.29	2004.16	1978.10	1952.11
P(3)	2131.63	2105.24	2078.94	2052.70	2026.52	2000.43	1974.40	1948.44
P(4)	2127.68	2101.32	2075.06	2048.85	2022.71	1996.65	1970.66	1944.73
P(5)	2123.70	2097.37	2071.15	2044.97	2018.86	1992.84	1966.88	1941.00
P(6)	2119.68	2093.39	2067.20	2041.06	2014.99	1989.00	1963.07	1937.22
P(7)	2115.63	2089.37	2063.21	2037.12	2011.08	1985.12	1959.23	1933.41
P(8)	2111.54	2085.32	2059.20	2033.14	2007.13	1981.21	1955.36	1929.58
P(9)	2107.42	2081.23	2055.15	2029.12	2003.14	1977.27	1951.45	1925.70
P(10)	2103.27	2077.11	2051.07	2025.07	1999.14	1973.29	1947.50	1921.79
P(11)	2099.08	2072.96	2046.95	2020.98	1995.09	1969.27	1943.52	1917.85
P(12)	2094.86	2068.78	2042.80	2016.88	1991.01	1965.23	1939.52	1913.88
P(13)	2090.60	2064.55	2038.62	2012.72	1986.90	1961.15	1935.47	1909.87
P(14)	2086.32	2060.31	2034.40	2008.54	1982.75	1957.04	1931.40	1905.83
P(15)	2082.00	2056.02	2030.15	2004.33	1978.57	1952.90	1927.29	1901.76
P(16)	2077.64	2051.70	2025.86	2000.08	1974.35	1948.71	1923.14	1897.64
P(17)	2073.26	2047.35	2021.56	1995.81	1970.12	1944.51	1918.98	1893.51
P(18)	2068.84	2042.96	2017.20	1991.48	1965.83	1940.27	1914.77	1889.33
P(19)	2064.39	2038.55	2012.83	1987.15	1961.53	1935.99	1910.53	1885.13
P(20)	2059.91	2034.10	2008.41	1982.77	1957.18	1931.69	1906.26	1880.90
P(21)	2055.39	2029.63	2003.96	1978.36	1952.81	1927.35	1901.95	1876.63
P(22)	2050.84	2025.12	1999.49	1973.92	1948.41	1922.98	1897.62	1872.33
P(23)	2046.26	2020.58	1994.98	1969.45	1943.96	1918.58	1893.25	1868.00
P(24)	2041.65	2016.00	1990.45	1964.94	1939.50	1914.14	1888.85	1863.63
P(25)	2037.01	2011.40	1985.88	1960.41	1935.00	1909.68	1884.43	1859.23
P(26)	2032.34	2006.76	1981.27	1955.84	1930.46	1905.18	1879.96	1854.81
P(27)	2027.63	2002.09	1976.64	1951.24	1925.91	1900.66	1875.46	1850.36
P(28)	2022.90	1997.39	1971.98	1946.61	1921.31	1896.10	1870.95	1845.87
P(29)	2018.13	1992.66	1967.28	1941.95	1916.69	1891.51	1866.39	1841.35
P(30)	2013.33	1987.90	1962.55	1937.26	1912.03	1886.88	1861.81	1836.80

CARBON MONOXIDE (CO).

P-BRANCH IN 1/CM (CONTINUE)

	9 - 8	10 - 9	11-10	12-11	13-12	14-13	15-14	16-15
P(1)	1929.80	1903.93	1878.15	1852.43	1826.80	1801.25	1775.79	1750.41
P(2)	1926.19	1900.36	1874.61	1848.93	1823.34	1797.82	1772.39	1747.05
P(3)	1922.56	1896.77	1871.05	1845.39	1819.84	1794.36	1768.97	1743.66
P(4)	1918.89	1893.13	1867.45	1841.83	1816.31	1790.86	1765.50	1740.23
P(5)	1915.18	1889.46	1863.81	1838.23	1812.75	1787.34	1762.01	1736.77
P(6)	1911.45	1885.76	1860.14	1834.60	1809.15	1783.77	1758.48	1733.28
P(7)	1907.67	1882.02	1856.45	1830.93	1805.52	1780.18	1754.92	1729.75
P(8)	1903.87	1878.25	1852.71	1827.23	1801.86	1776.55	1751.33	1726.19
P(9)	1900.03	1874.44	1848.94	1823.50	1798.15	1772.88	1747.70	1722.59
P(10)	1896.16	1870.61	1845.14	1819.73	1794.42	1769.19	1744.04	1718.97
P(11)	1892.25	1866.73	1841.30	1815.93	1790.65	1765.45	1740.33	1715.30
P(12)	1888.32	1862.83	1837.43	1812.10	1786.86	1761.69	1736.61	1711.61
P(13)	1884.34	1858.89	1833.52	1808.23	1783.02	1757.88	1732.85	1707.88
P(14)	1880.33	1854.92	1829.59	1804.32	1779.16	1754.05	1729.05	1704.13
P(15)	1876.30	1850.92	1825.63	1800.39	1775.26	1750.20	1725.22	1700.34
P(16)	1872.22	1846.88	1821.62	1796.42	1771.32	1746.30	1721.36	1696.50
P(17)	1868.12	1842.82	1817.59	1792.43	1767.36	1742.37	1717.47	1692.65
P(18)	1863.98	1838.71	1813.52	1788.39	1763.36	1738.40	1713.54	1688.75
P(19)	1859.81	1834.58	1809.43	1784.33	1759.34	1734.42	1709.58	1684.83
P(20)	1855.61	1830.41	1805.29	1780.23	1755.28	1730.39	1705.60	1680.88
P(21)	1851.38	1826.21	1801.13	1776.11	1751.19	1726.33	1701.57	1676.89
P(22)	1847.11	1821.98	1796.93	1771.95	1747.06	1722.25	1697.52	1672.87
P(23)	1842.82	1817.72	1792.71	1767.76	1742.91	1718.13	1693.43	1668.82
P(24)	1838.49	1813.43	1788.45	1763.54	1738.71	1713.98	1689.31	1664.73
P(25)	1834.13	1809.11	1784.16	1759.29	1734.50	1709.79	1685.17	1660.63
P(26)	1829.74	1804.75	1779.84	1755.00	1730.25	1705.57	1680.99	1656.48
P(27)	1825.32	1800.37	1775.49	1750.69	1725.97	1701.33	1676.77	1652.30
P(28)	1820.86	1795.95	1771.11	1746.33	1721.65	1697.05	1672.54	1648.10
P(29)	1816.38	1791.50	1766.70	1741.96	1717.32	1692.75	1668.26	1643.87
P(30)	1811.87	1787.02	1762.26	1737.55	1712.94	1688.41	1663.96	1639.59

CARBON MONOXIDE (CO).

R-BRANCH IN 1/CM

	1 - 0	2 - 1	3 - 2	4 - 3	5 - 4	6 - 5	7 - 6	8 - 7
R(0)	2147.08	2120.55	2094.11	2067.72	2041.40	2015.17	1989.00	1962.90
R(1)	2150.86	2124.29	2097.82	2071.40	2045.05	2018.78	1992.57	1966.44
R(2)	2154.60	2127.99	2101.48	2075.03	2048.64	2022.34	1996.10	1969.93
R(3)	2158.30	2131.66	2105.12	2078.63	2052.21	2025.86	1999.59	1973.39
R(4)	2161.97	2135.29	2108.72	2082.20	2055.74	2029.36	2003.06	1976.82
R(5)	2165.60	2138.89	2112.28	2085.72	2059.23	2032.82	2006.48	1980.21
R(6)	2169.20	2142.45	2115.80	2089.21	2062.69	2036.24	2009.87	1983.56
R(7)	2172.76	2145.97	2119.29	2092.67	2066.11	2039.63	2013.22	1986.87
R(8)	2176.28	2149.47	2122.76	2096.10	2069.50	2042.98	2016.53	1990.15
R(9)	2179.77	2152.92	2126.18	2099.47	2072.84	2046.29	2019.81	1993.40
R(10)	2183.22	2156.34	2129.56	2102.82	2076.16	2049.57	2023.05	1996.61
R(11)	2186.64	2159.71	2132.90	2106.13	2079.43	2052.80	2026.25	1999.77
R(12)	2190.02	2163.06	2136.21	2109.40	2082.67	2056.02	2029.43	2002.91
R(13)	2193.36	2166.37	2139.48	2112.64	2085.87	2059.18	2032.56	2006.02
R(14)	2196.66	2169.63	2142.71	2115.84	2089.03	2062.31	2035.66	2009.07
R(15)	2199.93	2172.87	2145.92	2119.01	2092.17	2065.41	2038.72	2012.10
R(16)	2203.16	2176.06	2149.07	2122.13	2095.25	2068.46	2041.73	2015.08
R(17)	2206.35	2179.22	2152.20	2125.23	2098.31	2071.48	2044.72	2018.03
R(18)	2209.51	2182.34	2155.28	2128.27	2101.32	2074.46	2047.67	2020.94
R(19)	2212.62	2185.42	2158.32	2131.29	2104.30	2077.40	2050.57	2023.81
R(20)	2215.70	2188.46	2161.34	2134.26	2107.24	2080.31	2053.45	2026.66
R(21)	2218.73	2191.47	2164.30	2137.19	2110.14	2083.18	2056.28	2029.45
R(22)	2221.74	2194.44	2167.24	2140.09	2113.00	2086.00	2059.07	2032.20
R(23)	2224.70	2197.37	2170.14	2142.95	2115.83	2088.80	2061.82	2034.92
R(24)	2227.63	2200.26	2172.99	2145.77	2118.61	2091.54	2064.54	2037.61
R(25)	2230.51	2203.12	2175.81	2148.55	2121.36	2094.26	2067.22	2040.25
R(26)	2233.36	2205.93	2178.59	2151.29	2124.07	2096.93	2069.86	2042.86
R(27)	2236.17	2208.70	2181.32	2154.00	2126.74	2099.57	2072.45	2045.42
R(28)	2238.94	2211.44	2184.02	2156.66	2129.37	2102.16	2075.02	2047.95
R(29)	2241.67	2214.14	2186.68	2159.29	2131.96	2104.72	2077.55	2050.43

CARBON MONOXIDE (CO).

R-BRANCH IN 1/CM (CONTINUE)

	9 - 8	10 - 9	11-10	12-11	13-12	14-13	15-14	16-15
R(0)	1936.88	1910.95	1885.09	1859.30	1833.61	1807.98	1782.45	1757.00
R(1)	1940.39	1914.41	1888.52	1862.70	1836.97	1811.31	1785.75	1760.26
R(2)	1943.84	1917.84	1891.91	1866.05	1840.29	1814.60	1789.00	1763.48
R(3)	1947.27	1921.23	1895.27	1869.37	1843.57	1817.85	1792.21	1766.66
R(4)	1950.66	1924.59	1898.59	1872.66	1846.83	1821.07	1795.39	1769.80
R(5)	1954.01	1927.90	1901.87	1875.91	1850.04	1824.24	1798.54	1772.91
R(6)	1957.33	1931.18	1905.12	1879.12	1853.22	1827.39	1801.64	1775.98
R(7)	1960.61	1934.43	1908.33	1882.30	1856.36	1830.49	1804.71	1779.02
R(8)	1963.86	1937.64	1911.51	1885.44	1859.47	1833.57	1807.76	1782.03
R(9)	1967.07	1940.81	1914.64	1888.54	1862.53	1836.60	1810.75	1784.98
R(10)	1970.24	1943.95	1917.75	1891.61	1865.57	1839.61	1813.72	1787.93
R(11)	1973.38	1947.05	1920.81	1894.64	1868.57	1842.56	1816.64	1790.81
R(12)	1976.48	1950.12	1923.85	1897.64	1871.53	1845.49	1819.54	1793.67
R(13)	1979.54	1953.15	1926.84	1900.60	1874.45	1848.38	1822.39	1796.49
R(14)	1982.56	1956.14	1929.80	1903.52	1877.34	1851.23	1825.21	1799.27
R(15)	1985.55	1959.10	1932.72	1906.41	1880.19	1854.05	1827.99	1802.02
R(16)	1988.50	1962.01	1935.59	1909.25	1883.00	1856.82	1830.73	1804.73
R(17)	1991.42	1964.89	1938.45	1912.07	1885.78	1859.57	1833.45	1807.40
R(18)	1994.29	1967.73	1941.25	1914.83	1888.51	1862.27	1836.11	1810.03
R(19)	1997.13	1970.54	1944.02	1917.57	1891.21	1864.93	1838.73	1812.63
R(20)	1999.93	1973.30	1946.75	1920.26	1893.87	1867.56	1841.34	1815.19
R(21)	2002.69	1976.03	1949.44	1922.92	1896.50	1870.15	1843.89	1817.70
R(22)	2005.42	1978.72	1952.10	1925.54	1899.09	1872.70	1846.40	1820.18
R(23)	2008.11	1981.37	1954.71	1928.13	1901.63	1875.21	1848.88	1822.63
R(24)	2010.76	1983.98	1957.29	1930.66	1904.14	1877.69	1851.32	1825.04
R(25)	2013.36	1986.55	1959.83	1933.18	1906.61	1880.12	1853.72	1827.40
R(26)	2015.93	1989.09	1962.33	1935.64	1909.04	1882.52	1856.08	1829.73
R(27)	2018.46	1991.59	1964.79	1938.07	1911.44	1884.88	1858.40	1832.02
R(28)	2020.95	1994.04	1967.22	1940.45	1913.79	1887.19	1860.69	1834.27
R(29)	2023.41	1996.46	1969.60	1942.80	1916.10	1889.48	1862.94	1836.48

NITRIC OXIDE (NO)

LIST OF INPUT DATA

ω_e	=	0.19040E 04	ω_e^A	=	0.13995E 02	α_e^A	=	0.24000E 00	D_{01}	=	0.16000E-05
B_{02}	=	0.17201E 01	α_e^B	=	0.17160E-01	α_e^B	=	0.18063E-01	B_{01}	=	0.16723E 01
β_{Cl}	=	0.12000E-06	β_{e2}	=	-0.16000E-06	Λ_e	=	0.12361E 03	D_{02}	=	0.95000E-05

REFERENCES:

- (7) M.D. Olman, M. Dominic, Mc Nelis, C.D. Hause
J. Mol. Spectr. 14, 62 (1964) (absorption)
 - (8) T.F. Deutsch
Appl. Phys. Letters 9, 295 (1966) (laser emission)
 - (6) M.A. Pollack
Appl. Phys. Letters 9, 94 (1966) (laser emission)
 - (9) D.B. Keck and C.D. Hause
J. Mol. Spectr. 26, 163 (1968) (absorption)
- vibrational constants ω_e , ω_e^A are taken from ref. (8)
the other molecular constants are taken from ref. (7)

NITRIC OXIDE (NO) SUBSTATE $2\pi_{1/2}$

ENERGY LEVELS IN 1/CM

J	V = 0	V = 1	V = 2	V = 3	V = 4	V = 5	V = 6	V = 7	V = 8
J = 0.5	0.0	1876.10	3724.21	5544.33	7336.46	9100.61	10836.77	12544.93	14225.11
J = 1.5	5.02	1881.07	3729.12	5549.19	7341.28	9105.37	10841.48	12549.59	14229.71
J = 2.5	13.38	1889.35	3737.32	5557.29	7349.30	9113.30	10849.32	12557.35	14237.39
J = 3.5	25.08	1900.93	3748.78	5568.64	7360.52	9124.40	10860.30	12568.21	14248.13
J = 4.5	40.14	1915.83	3763.52	5583.22	7374.95	9138.68	10874.43	12582.18	14261.95
J = 5.5	58.53	1934.03	3781.54	5601.05	7392.59	9156.13	10891.69	12599.25	14278.83
J = 6.5	80.27	1955.55	3802.83	5622.12	7413.44	9176.75	10912.09	12619.43	14298.79
J = 7.5	105.35	1980.37	3827.40	5646.43	7437.49	9200.55	10935.63	12642.71	14321.81
J = 8.5	133.78	2008.51	3855.23	5673.98	7464.75	9227.51	10962.30	12669.09	14347.89
J = 9.5	165.54	2039.95	3886.36	5704.77	7495.21	9257.65	10992.11	12698.57	14377.05
J = 10.5	200.66	2074.70	3920.75	5738.80	7528.88	9290.95	11025.06	12731.16	14409.28
J = 11.5	239.11	2112.76	3958.41	5776.07	7565.75	9327.43	11061.14	12766.85	14444.57
J = 12.5	280.91	2154.12	3999.34	5816.57	7605.82	9367.08	11100.36	12805.63	14482.93
J = 13.5	326.04	2198.80	4043.55	5860.32	7649.11	9409.89	11142.71	12847.52	14524.34
J = 14.5	374.52	2246.78	4091.03	5907.30	7695.59	9455.88	11188.19	12892.50	14568.83
J = 15.5	426.34	2298.06	4141.78	5957.52	7745.27	9505.03	11236.80	12940.59	14616.38
J = 16.5	481.50	2352.65	4195.80	6010.97	7798.15	9557.34	11288.55	12991.76	14666.99
J = 17.5	539.99	2410.54	4253.09	6067.66	7854.24	9612.82	11343.43	13046.04	14720.66
J = 18.5	601.83	2471.74	4313.65	6127.57	7913.52	9671.47	11401.44	13103.41	14777.39
J = 19.5	667.00	2536.24	4377.48	6190.73	7976.00	9733.28	11462.57	13163.87	14837.18
J = 20.5	735.51	2604.05	4444.57	6257.12	8041.68	9798.25	11526.84	13227.43	14900.03

NITRIC OXIDE (NO) $2\pi_{1/2}$

ENERGY LEVELS IN 1/CM (CONTINUE)

J =	V = 9	V = 10	V = 11	V = 12	V = 13	V = 14	V = 15	V = 16
J = 0.5	15877.29	17501.49	19097.69	20665.91	22206.13	23718.37	25202.61	26658.87
J = 1.5	15981.84	17505.99	19102.14	20670.30	22210.48	23722.66	25206.86	26663.06
J = 2.5	15889.43	17513.50	19109.56	20677.64	22217.72	23729.82	25213.93	26670.05
J = 3.5	15900.05	17524.00	19119.94	20687.90	22227.86	23739.85	25223.83	26675.83
J = 4.5	15913.71	17537.50	19133.25	20701.10	22240.91	23752.73	25236.56	26692.41
J = 5.5	15930.41	17554.01	19149.61	20717.23	22256.85	23768.48	25252.13	26707.78
J = 6.5	15950.14	17573.52	19168.89	20736.29	22275.68	23787.10	25270.52	26725.95
J = 7.5	15972.90	17596.02	19191.14	20758.27	22297.41	23808.57	25291.73	26746.91
J = 8.5	15998.70	17621.53	19216.36	20783.20	22322.04	23832.91	25315.78	26770.66
J = 9.5	16027.53	17650.03	19244.53	20811.05	22349.57	23860.11	25342.65	26797.21
J = 10.5	16059.39	17681.54	19275.68	20841.83	22379.99	23890.17	25372.35	26826.54
J = 11.5	16094.29	17716.04	19309.78	20875.54	22413.30	23923.09	25404.88	26858.67
J = 12.5	16132.21	17753.53	19346.84	20912.17	22449.51	23958.87	25440.22	26893.59
J = 13.5	16173.17	17794.02	19386.87	20951.74	22488.61	23997.50	25478.39	26931.30
J = 14.5	16217.16	17837.51	19429.86	20994.23	22530.60	24038.99	25519.38	26971.79
J = 15.5	16264.18	17883.99	19475.81	21039.64	22575.48	24083.34	25563.20	27015.07
J = 16.5	16314.21	17933.46	19524.71	21087.98	22623.25	24130.54	25609.82	27061.13
J = 17.5	16367.29	17985.93	19576.57	21139.24	22673.90	24180.59	25659.27	27109.98
J = 18.5	16423.38	18041.39	19631.39	21193.41	22727.45	24233.49	25711.54	27161.60
J = 19.5	16482.50	18095.83	19689.16	21250.52	22783.87	24289.25	25766.62	27216.02
J = 20.5	16544.64	18161.27	19749.89	21310.53	22843.18	24347.85	25824.52	27273.20

NITRIC OXIDE (NO) $2\Pi_{1/2}$

R-BRANCH IN 1/CM

R(J-1/2)	1 - 0	2 - 1	3 - 2	4 - 3	5 - 4	6 - 5	7 - 6	8 - 7
R(0)	1881.07	1853.02	1824.98	1796.95	1768.90	1740.87	1712.82	1684.78
R(1)	1884.33	1856.25	1828.17	1800.11	1772.02	1743.96	1715.87	1687.80
R(2)	1887.55	1859.43	1831.32	1803.23	1775.10	1747.01	1718.89	1690.79
R(3)	1890.74	1862.59	1834.45	1806.31	1778.16	1750.03	1721.88	1693.74
R(4)	1893.90	1865.71	1837.54	1809.37	1781.18	1753.01	1724.82	1696.65
R(5)	1897.02	1868.79	1840.58	1812.38	1784.16	1755.96	1727.74	1699.53
R(6)	1900.11	1871.85	1843.61	1815.37	1787.11	1758.88	1730.62	1702.38
R(7)	1903.16	1874.86	1846.58	1818.31	1790.02	1761.76	1733.46	1705.18
R(8)	1906.17	1877.85	1849.54	1821.23	1792.90	1764.60	1736.27	1707.96
R(9)	1909.16	1880.80	1852.44	1824.11	1795.75	1767.41	1739.04	1710.70
R(10)	1912.10	1883.71	1855.32	1826.95	1798.55	1770.18	1741.79	1713.41
R(11)	1915.01	1886.58	1858.16	1829.76	1801.33	1772.92	1744.50	1716.08
R(12)	1917.89	1889.43	1860.98	1832.54	1804.07	1775.63	1747.16	1718.71
R(13)	1920.73	1892.23	1863.75	1835.27	1806.77	1778.30	1749.79	1721.31
R(14)	1923.54	1895.00	1866.48	1837.97	1809.44	1780.93	1752.39	1723.88
R(15)	1926.31	1897.74	1869.19	1840.64	1812.07	1783.52	1754.96	1726.40
R(16)	1929.05	1900.44	1871.86	1843.27	1814.67	1786.09	1757.49	1728.90
R(17)	1931.75	1903.10	1874.48	1845.86	1817.23	1788.61	1759.98	1731.35
R(18)	1934.41	1905.73	1877.08	1848.43	1819.76	1791.11	1762.43	1733.78
R(19)	1937.04	1908.33	1879.64	1850.95	1822.25	1793.56	1764.85	1736.16

NITRIC OXIDE (NO) $2\pi_{1/2}$

R-BRANCH IN L/CM (CONTINUE)

R($j-1/2$)	9 - 8	10 - 9	11 - 10	12 - 11	13 - 12	14 - 13	15 - 14	16 - 15
R(0)	1656.73	1628.70	1600.65	1572.62	1544.57	1516.54	1488.49	1460.45
R(1)	1659.72	1631.65	1603.57	1575.50	1547.42	1519.34	1491.26	1463.19
R(2)	1662.66	1634.56	1606.44	1578.34	1550.23	1522.13	1494.01	1465.90
R(3)	1665.58	1637.45	1609.29	1581.16	1553.01	1524.87	1496.71	1468.58
R(4)	1668.46	1640.30	1612.11	1583.94	1555.75	1527.58	1499.39	1471.22
R(5)	1671.31	1643.11	1614.88	1586.68	1558.46	1530.25	1502.03	1473.82
R(6)	1674.12	1645.88	1617.62	1589.38	1561.13	1532.89	1504.63	1476.39
R(7)	1676.89	1648.63	1620.33	1592.05	1563.77	1535.50	1507.21	1478.93
R(8)	1679.64	1651.33	1623.00	1594.70	1566.38	1538.07	1509.74	1481.43
R(9)	1682.34	1654.00	1625.64	1597.30	1568.94	1540.59	1512.24	1483.89
R(10)	1685.01	1656.64	1628.24	1599.86	1571.48	1543.09	1514.71	1486.32
R(11)	1687.65	1659.24	1630.81	1602.39	1573.98	1545.56	1517.13	1488.71
R(12)	1690.25	1661.81	1633.34	1604.89	1576.44	1547.98	1519.52	1491.08
R(13)	1692.82	1664.34	1635.84	1607.36	1578.86	1550.38	1521.89	1493.40
R(14)	1695.35	1666.83	1638.30	1609.78	1581.25	1552.73	1524.21	1495.68
R(15)	1697.84	1669.29	1640.72	1612.17	1583.61	1555.06	1526.49	1497.93
R(16)	1700.30	1671.71	1643.11	1614.53	1585.92	1557.34	1528.73	1500.15
R(17)	1702.72	1674.10	1645.46	1616.84	1588.21	1559.59	1530.95	1502.33
R(18)	1705.11	1676.45	1647.78	1619.13	1590.46	1561.80	1533.13	1504.48
R(19)	1717.45	1678.77	1650.06	1621.37	1592.66	1563.98	1535.27	1506.58

NITRIC OXIDE (NO) $2\Pi_{1/2}$

P-BRANCH IN 1/CM

P($J-1/2$)	1 - 0	2 - 1	3 - 2	4 - 3	5 - 4	6 - 5	7 - 6	8 - 7
P(1)	1871.09	1843.14	1815.20	1787.27	1759.33	1731.40	1703.46	1675.52
P(2)	1867.69	1839.78	1811.88	1783.98	1756.07	1728.18	1700.27	1672.37
P(3)	1864.26	1836.38	1808.52	1780.66	1752.78	1724.93	1697.04	1669.18
P(4)	1860.80	1832.95	1805.12	1777.30	1749.45	1721.63	1693.78	1665.95
P(5)	1857.33	1829.49	1801.68	1773.89	1746.09	1718.30	1690.49	1662.70
P(6)	1853.77	1825.99	1798.23	1770.47	1742.69	1714.94	1687.16	1659.40
P(7)	1850.20	1822.45	1794.72	1767.00	1739.26	1711.54	1683.80	1656.07
P(8)	1846.60	1818.89	1791.20	1763.51	1735.80	1708.12	1680.41	1652.72
P(9)	1842.96	1815.28	1787.63	1759.97	1732.30	1704.66	1676.98	1649.32
P(10)	1839.29	1811.66	1784.03	1756.41	1728.77	1701.16	1673.52	1645.90
P(11)	1835.59	1807.99	1780.39	1752.81	1725.20	1697.63	1670.02	1642.43
P(12)	1831.85	1804.28	1776.73	1749.18	1721.61	1694.05	1666.49	1638.93
P(13)	1828.03	1800.54	1773.02	1745.51	1717.98	1690.46	1662.93	1635.41
P(14)	1824.28	1796.77	1769.29	1741.81	1714.31	1686.83	1659.33	1631.84
P(15)	1820.44	1792.97	1765.52	1738.07	1710.61	1683.16	1655.70	1628.24
P(16)	1816.55	1789.13	1761.72	1734.30	1706.88	1679.46	1652.04	1624.62
P(17)	1812.66	1785.25	1757.88	1730.50	1703.11	1675.73	1648.33	1620.95
P(18)	1808.71	1781.35	1754.01	1726.66	1699.30	1671.96	1644.60	1617.25
P(19)	1804.74	1777.41	1750.10	1722.79	1695.46	1668.16	1640.83	1613.52
P(20)	1800.73	1773.43	1746.16	1718.89	1691.60	1664.32	1637.03	1609.76

NITRIC OXIDE (NO) $2\Pi_{1/2}$

P-BRANCH IN I/CM (CONTINUE)

P($J-1/2$)	9 - 8	10 - 9	11 - 10	12 - 11	13 - 12	14 - 13	15 - 14	16 - 15
P(1)	1647.57	1619.65	1591.70	1563.77	1535.82	1507.89	1479.95	1452.01
P(2)	1644.45	1616.56	1588.64	1560.75	1532.84	1504.94	1477.04	1449.13
P(3)	1641.30	1613.44	1585.56	1557.70	1529.82	1501.96	1474.08	1446.22
P(4)	1638.11	1610.28	1582.43	1554.61	1526.77	1498.94	1471.09	1443.27
P(5)	1634.83	1607.09	1579.28	1551.49	1523.68	1495.89	1468.08	1440.29
P(6)	1631.63	1603.87	1576.09	1548.34	1520.56	1492.80	1465.02	1437.27
P(7)	1628.33	1600.62	1572.87	1545.14	1517.41	1489.69	1461.94	1434.21
P(8)	1625.01	1597.32	1569.61	1541.92	1514.22	1486.53	1458.82	1431.13
P(9)	1621.64	1594.00	1566.32	1538.66	1510.99	1483.34	1455.67	1428.01
P(10)	1618.25	1590.64	1563.00	1535.38	1507.75	1480.12	1452.48	1424.86
P(11)	1614.83	1587.25	1559.64	1532.05	1504.46	1476.86	1449.27	1421.67
P(12)	1611.36	1583.82	1556.25	1528.69	1501.13	1473.57	1446.01	1418.45
P(13)	1607.87	1580.36	1552.82	1525.30	1497.77	1470.26	1442.72	1415.20
P(14)	1604.34	1576.86	1549.36	1521.83	1494.38	1466.89	1439.40	1411.91
P(15)	1600.78	1573.33	1545.87	1518.42	1490.96	1463.51	1436.05	1408.59
P(16)	1597.19	1569.78	1542.34	1514.93	1487.50	1460.09	1432.66	1405.24
P(17)	1593.55	1566.18	1538.78	1511.41	1484.01	1456.64	1429.23	1401.86
P(18)	1589.89	1562.55	1535.19	1507.85	1480.49	1453.14	1425.78	1398.44
P(19)	1586.23	1558.89	1531.56	1504.25	1476.93	1449.62	1422.29	1394.98
P(20)	1582.46	1555.20	1527.90	1500.63	1473.34	1446.07	1418.77	1391.50

NITRIC OXIDE (NO) SUBSTATE $2\Pi_{3/2}$

ENERGY LEVELS IN 1/CM

J =	V = 0	V = 1	V = 2	V = 3	V = 4	V = 5	V = 6	V = 7	V = 8
J = 1,5	125.31	2001.15	3849.00	5668.86	7460.73	9224.62	10960.52	12668.41	14348.33
J = 2,5	133.91	2009.66	3857.41	5677.18	7468.96	9232.76	10968.57	12676.38	14356.20
J = 3,5	145.94	2021.57	3869.20	5688.84	7480.50	9244.17	10979.85	12687.54	14367.23
J = 4,5	161.42	2036.89	3884.35	5703.83	7495.32	9258.84	10994.35	12701.88	14381.41
J = 5,5	180.34	2055.60	3902.87	5722.15	7513.45	9276.76	11012.08	12719.40	14399.74
J = 6,5	202.69	2077.72	3924.75	5743.80	7534.86	9297.93	11033.02	12740.11	14419.21
J = 7,5	228.47	2103.24	3950.00	5768.77	7559.56	9322.37	11057.18	12764.00	14442.83
J = 8,5	257.69	2132.15	3978.60	5797.07	7587.55	9350.05	11084.56	12791.07	14469.60
J = 9,5	290.34	2164.46	4010.57	5828.70	7618.83	9380.99	11115.16	12821.32	14499.50
J = 10,5	326.42	2200.16	4045.89	5863.64	7653.39	9415.18	11148.96	12854.75	14532.55
J = 11,5	365.93	2239.25	4084.56	5901.90	7691.25	9452.61	11185.98	12891.36	14568.74
J = 12,5	408.85	2281.72	4126.59	5943.48	7732.37	9493.29	11226.21	12931.13	14608.07
J = 13,5	455.20	2327.59	4171.97	5988.37	7776.78	9537.20	11269.64	12974.08	14650.53
J = 14,5	504.97	2376.83	4220.69	6036.57	7824.46	9584.36	11316.28	13020.19	14696.12
J = 15,5	558.15	2429.46	4272.76	6088.08	7875.41	9634.76	11366.11	13069.47	14744.84
J = 16,5	614.75	2485.46	4328.16	6142.89	7929.63	9688.39	11419.14	13121.91	14796.69
J = 17,5	674.75	2544.83	4386.91	6201.01	7987.12	9745.24	11475.38	13177.52	14851.66
J = 18,5	738.15	2607.57	4448.98	6262.41	8047.86	9805.32	11534.79	13236.27	14909.75
J = 19,5	804.95	2673.67	4514.39	6327.12	8111.87	9868.63	11597.40	13298.17	14970.96
J = 20,5	875.15	2743.13	4583.11	6395.11	8179.13	9935.15	11663.18	13363.22	15035.27
J = 21,5	948.74	2815.95	4655.16	6466.39	8249.63	10004.88	11732.15	13431.42	15102.70

NITRIC OXIDE (NO) $2\pi_{3/2}$
 ENERGY LEVELS IN 1/CM (CONTINUE)

J =	V = 9	V = 10	V = 11	V = 12	V = 13	V = 14	V = 15	V = 16
J = 1.5	16000.26	17624.19	19220.14	20788.10	22328.06	23840.03	25324.02	26780.01
J = 2.5	16008.04	17631.89	19227.74	20795.61	22335.48	23847.36	25331.26	26787.16
J = 3.5	16018.95	17642.66	19238.39	20806.13	22345.88	23857.63	25341.40	26797.18
J = 4.5	16032.96	17656.52	19252.08	20819.66	22359.24	23870.84	25354.44	26810.06
J = 5.5	16050.09	17673.45	19269.81	20836.19	22375.58	23886.97	25370.38	26825.80
J = 6.5	16070.33	17693.45	19288.58	20855.73	22394.88	23906.04	25389.21	26844.39
J = 7.5	16093.68	17716.53	19311.39	20878.27	22417.15	23928.04	25410.93	26865.85
J = 8.5	16120.13	17742.68	19337.23	20903.80	22442.38	23952.96	25435.55	26890.16
J = 9.5	16149.70	17771.90	19366.12	20932.34	22470.57	23980.81	25463.06	26917.33
J = 10.5	16182.37	17804.20	19398.03	20963.88	22501.73	24011.59	25493.46	26947.35
J = 11.5	16218.14	17839.56	19432.98	20998.41	22535.85	24045.29	25526.75	26980.22
J = 12.5	16257.02	17877.98	19470.95	21035.93	22572.92	24081.92	25562.93	27015.95
J = 13.5	16299.00	17919.47	19511.95	21076.45	22612.95	24121.46	25601.98	27054.52
J = 14.5	16344.07	17964.02	19555.98	21119.96	22655.94	24163.92	25643.92	27095.94
J = 15.5	16392.23	18011.63	19603.03	21166.45	22701.87	24209.30	25688.74	27140.20
J = 16.5	16443.49	18062.29	19653.09	21215.92	22750.75	24257.59	25736.43	27187.30
J = 17.5	16497.82	18116.00	19706.18	21268.38	22802.57	24308.79	25787.00	27237.24
J = 18.5	16555.25	18172.76	19762.28	21323.81	22857.34	24362.89	25840.45	27290.01
J = 19.5	16615.76	18232.57	19821.38	21382.21	22915.05	24419.90	25896.75	27345.63
J = 20.5	16679.34	18295.41	19883.50	21443.59	22975.70	24479.80	25955.92	27404.06
J = 21.5	16746.00	18361.30	19948.61	21507.93	23039.27	24542.61	26017.95	27465.32

NITRIC OXIDE (NO) $2\Pi_{3/2}$

R-BRANCH IN 1/CM

R($j-1/2$)	1 - 0	2 - 1	3 - 2	4 - 3	5 - 4	6 - 5	7 - 6	8 - 7
R(1)	1884.35	1856.26	1828.18	1800.11	1772.04	1743.95	1715.86	1687.79
R(2)	1887.67	1859.54	1831.43	1803.32	1775.21	1747.09	1718.96	1690.85
R(3)	1890.94	1862.78	1834.63	1806.48	1778.34	1750.18	1722.02	1693.88
R(4)	1894.18	1865.98	1837.80	1809.62	1781.43	1753.24	1725.05	1696.86
R(5)	1897.38	1869.15	1840.93	1812.71	1784.48	1756.26	1728.03	1699.81
R(6)	1900.55	1872.27	1844.02	1815.77	1787.51	1759.25	1730.98	1702.72
R(7)	1903.67	1875.37	1847.08	1818.79	1790.49	1762.19	1733.89	1705.60
R(8)	1906.76	1878.42	1850.09	1821.76	1793.43	1765.10	1736.77	1708.43
R(9)	1909.81	1881.43	1853.07	1824.70	1796.34	1767.98	1739.59	1711.23
R(10)	1912.82	1884.41	1856.01	1827.61	1799.21	1770.80	1742.39	1713.99
R(11)	1915.80	1887.34	1858.91	1830.47	1802.04	1773.60	1745.15	1716.71
R(12)	1918.73	1890.24	1861.78	1833.30	1804.83	1776.36	1747.87	1719.40
R(13)	1921.63	1893.10	1864.60	1836.09	1807.59	1779.07	1750.55	1722.04
R(14)	1924.49	1895.92	1867.39	1838.84	1810.30	1781.75	1753.20	1724.65
R(15)	1927.30	1898.71	1870.13	1841.55	1812.98	1784.39	1755.80	1727.22
R(16)	1930.08	1901.45	1872.84	1844.23	1815.61	1786.99	1758.37	1729.75
R(17)	1932.82	1904.15	1875.51	1846.85	1818.21	1789.55	1760.89	1732.24
R(18)	1935.52	1906.82	1878.14	1849.45	1820.77	1792.07	1763.38	1734.69
R(19)	1938.18	1909.44	1880.73	1852.00	1823.29	1794.55	1765.82	1737.10
R(20)	1940.80	1912.03	1883.27	1854.52	1825.76	1797.00	1768.24	1739.48

NITRIC OXIDE (NO) $2\pi_{3/2}$

R-BRANCH IN 1/CM (CONTINUE)

R(j-1/2)	9 - 8	10- 9	11-10	12-11	13-12	14-13	15-14	16-15
R(1)	1659.71	1631.63	1603.55	1575.47	1547.39	1519.30	1491.23	1463.15
R(2)	1662.74	1634.63	1606.50	1578.39	1550.27	1522.15	1494.04	1465.93
R(3)	1665.73	1637.57	1609.41	1581.27	1553.11	1524.96	1496.80	1468.66
R(4)	1668.68	1640.49	1612.30	1584.11	1555.92	1527.73	1499.54	1471.36
R(5)	1671.59	1643.36	1615.14	1586.91	1558.69	1530.46	1502.23	1474.02
R(6)	1674.46	1646.20	1617.94	1589.68	1561.42	1533.16	1504.89	1476.64
R(7)	1677.30	1649.00	1620.71	1592.41	1564.11	1535.81	1507.52	1479.23
R(8)	1680.10	1651.77	1623.44	1595.11	1566.77	1538.43	1510.11	1481.77
R(9)	1682.87	1654.50	1626.13	1597.76	1569.39	1541.02	1512.65	1484.29
R(10)	1685.59	1657.19	1628.78	1600.38	1571.97	1543.56	1515.16	1486.76
R(11)	1688.28	1659.84	1631.39	1602.96	1574.51	1546.07	1517.63	1489.20
R(12)	1690.93	1662.45	1633.97	1605.50	1577.02	1548.54	1520.07	1491.59
R(13)	1693.54	1665.02	1636.51	1608.00	1579.49	1550.97	1522.46	1493.95
R(14)	1696.11	1667.56	1639.01	1610.47	1581.91	1553.36	1524.82	1496.27
R(15)	1698.64	1670.05	1641.47	1612.89	1584.30	1555.72	1527.14	1498.55
R(16)	1701.13	1672.51	1643.89	1615.28	1586.65	1558.04	1529.41	1500.80
R(17)	1703.59	1674.93	1646.28	1617.63	1588.97	1560.32	1531.66	1503.01
R(18)	1706.00	1677.31	1648.63	1619.94	1591.24	1562.55	1533.86	1505.18
R(19)	1708.38	1679.66	1650.93	1622.21	1593.48	1564.75	1536.02	1507.31
R(20)	1710.72	1681.96	1653.20	1624.44	1595.67	1566.91	1538.15	1509.40

NITRIC OXIDE (NO) $2\pi_{3/2}$

P-BRANCH IN 1/CM

P(J-1/2)	1 - 0	2 - 1	3 - 2	4 - 3	5 - 4	6 - 5	7 - 6	8 - 7
P(2)	1867.24	1839.34	1811.44	1783.55	1755.65	1727.75	1699.84	1671.95
P(3)	1863.72	1835.84	1807.98	1780.12	1752.26	1724.40	1696.53	1668.67
P(4)	1860.15	1832.31	1804.49	1776.67	1748.85	1721.02	1693.18	1665.36
P(5)	1856.55	1828.75	1800.96	1773.17	1745.39	1717.59	1689.80	1662.01
P(6)	1852.92	1825.15	1797.40	1769.65	1741.90	1714.14	1686.38	1658.63
P(7)	1849.25	1821.52	1793.80	1766.09	1738.37	1710.65	1682.93	1655.21
P(8)	1845.54	1817.85	1790.17	1762.49	1734.82	1707.13	1679.44	1651.76
P(9)	1841.81	1814.15	1786.51	1758.86	1731.22	1703.57	1675.92	1648.27
P(10)	1838.03	1810.41	1782.81	1755.20	1727.59	1699.98	1672.36	1644.75
P(11)	1834.23	1806.64	1779.07	1751.50	1723.93	1696.36	1668.77	1641.20
P(12)	1830.39	1802.84	1775.31	1747.77	1720.24	1692.70	1665.15	1637.61
P(13)	1826.52	1799.00	1771.51	1744.00	1716.51	1689.00	1661.49	1633.99
P(14)	1822.62	1795.14	1767.68	1740.21	1712.75	1685.28	1657.80	1630.34
P(15)	1818.68	1791.23	1763.81	1736.38	1708.95	1681.52	1654.08	1626.65
P(16)	1814.71	1787.30	1759.91	1732.52	1705.13	1677.73	1650.33	1622.93
P(17)	1810.71	1783.33	1755.98	1728.62	1701.27	1673.90	1646.54	1619.18
P(18)	1806.68	1779.34	1752.02	1724.70	1697.38	1670.05	1642.72	1615.39
P(19)	1802.61	1775.31	1748.03	1720.74	1693.46	1666.16	1638.87	1611.58
P(20)	1798.52	1771.25	1744.01	1716.75	1689.50	1662.25	1634.99	1607.73
P(24)	1794.39	1767.16	1739.95	1712.74	1685.52	1658.30	1631.07	1603.85

NITRIC OXIDE (NO) $2\Pi_{3/2}$
 P-BRANCH IN 1/CM (CONTINUE)

P($q-1/2$)	9 - 8	10 - 9	11 - 10	12 - 11	13 - 12	14 - 13	15 - 14	16 - 15
P(2)	1644.05	1616.15	1588.25	1560.36	1532.45	1504.55	1476.65	1448.75
P(3)	1640.81	1612.94	1585.07	1557.22	1529.35	1501.48	1473.63	1445.76
P(4)	1637.54	1609.71	1581.88	1554.05	1526.22	1498.39	1470.57	1442.75
P(5)	1634.22	1606.43	1578.63	1550.85	1523.05	1495.26	1467.46	1439.68
P(6)	1630.88	1603.12	1575.36	1547.61	1519.85	1492.09	1464.34	1436.59
P(7)	1627.50	1599.77	1572.05	1544.34	1516.61	1488.89	1461.17	1433.46
P(8)	1624.08	1596.39	1568.71	1541.03	1513.34	1485.66	1457.98	1430.29
P(9)	1620.63	1592.98	1565.33	1537.69	1510.04	1482.38	1454.74	1427.10
P(10)	1617.14	1589.53	1561.92	1534.31	1506.70	1479.08	1451.47	1423.87
P(11)	1613.63	1586.05	1558.47	1530.90	1503.32	1475.74	1448.17	1420.60
P(12)	1610.07	1582.54	1555.00	1527.46	1499.91	1472.38	1444.83	1417.30
P(13)	1606.49	1578.98	1551.48	1523.98	1496.47	1468.96	1441.46	1413.96
P(14)	1602.88	1575.40	1547.93	1520.47	1493.00	1465.52	1438.06	1410.59
P(15)	1599.22	1571.79	1544.35	1516.93	1489.49	1462.05	1434.63	1407.20
P(16)	1595.54	1568.14	1540.74	1513.36	1485.95	1458.55	1431.15	1403.76
P(17)	1591.83	1564.46	1537.09	1509.74	1482.38	1455.02	1427.65	1400.29
P(18)	1588.07	1560.75	1533.42	1506.10	1478.77	1451.44	1424.11	1396.79
P(19)	1584.30	1557.00	1529.71	1502.43	1475.13	1447.84	1420.55	1393.26
P(20)	1580.48	1553.23	1525.97	1498.72	1471.46	1444.20	1416.95	1389.70
P(21)	1576.64	1549.42	1522.20	1494.98	1467.76	1440.54	1413.32	1386.11

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