

HIGH-RESOLUTION FOURIER TRANSFORM SPECTROSCOPY OF THE MEINEL SYSTEM OF OH

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ABSTRACT

The infrared spectrum of the hydroxyl radical OH, between 1850 and 9000 cm⁻¹, has been measured with a Fourier transform spectrometer. The source, a hydrogen-ozone diffusion flame, was designed to study the excitation of rotation-vibration levels of the OH Meinel bands under conditions similar to those in the upper atmosphere which produce the nighttime OH airglow emission. Twenty-three bands were observed: nine bands in the $\Delta v = 1$ sequence, nine bands in the $\Delta v = 2$ sequence, and five bands in the $\Delta v = 3$ sequence. A global nonlinear least-squares fit of 1696 lines yielded molecular parameters with a standard deviation of 0.003 cm⁻¹. Term values are computed, and transition frequencies in the $\Delta v = 3, 4, 5, 6$ sequences in the near-infrared are predicted.

Subject headings: laboratory spectra — molecular processes

1. INTRODUCTION

Meinel (1950) first observed the vibration-rotation spectrum of the hydroxyl radical in the night sky. The bright airglow is produced by a chemical reaction of hydrogen and ozone in the Earth's upper atmosphere. The band system has been observed in planetary and stellar atmospheres and oxygen-supported flames. Langhoff et al. (1983) suggested that the surface glow observed on the *Atmosphere Explorer* satellites is due at least partially to emission from vibrationally excited OH radicals produced by surface interactions with ground-state oxygen atoms. The first astronomical observations of OH rotational emission was observed in the Orion outflow region by Storey, Watson, & Townes (1981). Vibration-rotation and pure rotation bands of OH have been observed in the infrared spectrum of the photosphere of the Sun (Grevesse, Sauval, & van Dishoeck 1984; Sauval et al. 1984), in late-type (OH) stars (Beer et al. 1972; Lambert et al. 1984), and in interstellar space (Robinson & McGee 1967). The advent of large-format near-infrared array detectors has expanded the utility of the 2 μ m telluric window for astronomical observations. The OH airglow emission lines are strong and variable and present a significant calibration problem. Oliva & Origlia (1992) reported the measurement of many OH airglow lines that can be used for calibration for infrared spectrometers. Osterbrock & Martel (1992) obtained accurate rest wave-

lengths for OH vibration-rotation spectral lines and discuss the suitability of certain lines for wavelength calibration. Ramsay, Mountain, & Geballe (1992) reported measurements of the nonthermal emission of the hydroxyl radical and examine the temporal and spatial variability of the emission.

Several high-resolution spectroscopic studies have provided detailed measurements of the transition frequencies of the OH radical in recent years. The Λ -doubling transitions in the ground state have been measured by Brown et al. (1978) using electron paramagnetic resonance techniques and laser magnetic resonance spectroscopy (Brown et al. 1981). Lemoine, Bogey, & Destombes (1985) measured 39 pure rotational transitions of OH in the $v = 0$ and $v = 1$ vibrational states using a laser diode spectrometer. Maillard, Chauville, & Mantz (1976) observed nine vibration-rotation bands of OH in the emission of an oxyacetylene flame with a Fourier transform spectrometer from which transitions between the first five vibrational states were obtained. Term values for $v > 5$ vibrational energy levels were obtained by Coxon (1980) from a merging of spectroscopic measurements made in the microwave, infrared, and ultraviolet spectral regions. The fundamental vibration-rotation bands of OH and OD were measured by Amano (1984) using difference frequency laser spectroscopy which resolved satellite lines. Abrams et al. (1990) measured the 1–0 and 2–1 bands of OH to study highly excited rotational states of the Meinel system. Sappéy & Copeland (1990) used laser double-resonance to study highly excited vibrational transitions between the $v = 8$ and $v = 12$ vibrational energy levels of the ground state leading to new molecular parameters for the $v = 8$ and 12 states of OH (Coxon, Sappéy, & Copeland 1991).

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We report a new measurement of the infrared spectrum of the hydroxyl radical produced in a diffusion reaction of hydrogen and ozone at low pressure which approximates the conditions under which the chemiluminescent emission of the nighttime airglow is observed. The distribution of lines among the bands is indicated in Table 1 which summarizes the number of lines in each branch and band; under each branch are listed the number of observed lines and the maximum J -values (in parentheses). This measurement greatly expands on previous measurements of the spectrum of the hydroxyl radical and should provide accurate line positions for a majority of the spectral features of the infrared air glow. In a related work Chackerian et al. (1992) are using the spectrum reported in the present work to evaluate rovibrational intensities and the electric dipole moment function for the hydroxyl radical.

The spectrum lines were subjected to a simultaneous non-linear least-squares fit to determine optimum molecular parameters and energy levels. The parameters display a slow variation with vibrational quantum number. The extension of the Meinel bands may allow for the identification of additional lines of OH in the infrared in stellar and atmospheric sources that have not been previously observed in terrestrial sources. Hamiltonian parameters and energy levels are provided to simplify the inclusion of the data into existing spectrum synthesis programs. Line positions are predicted for infrared and visible transitions in the $\Delta v = 3, 4, 5$, and 6 sequences that are not directly measured in the present work.

2. EXPERIMENTAL

A reaction cell was fabricated that permitted the formation and excitation of the hydroxyl radical under conditions similar to those found in the upper atmosphere ($P = 4$ torr, $T \leq 300$ K). The radicals were formed by flowing purified gaseous

TABLE 1
SUMMARY OF OBSERVED BANDS

Δv	$v' - v''$	P	Q	R
1	1-0	61 (17.5)	23 (6.5)	28 (8.5)
	2-1	67 (19.5)	26 (6.5)	26 (7.5)
	3-2	65 (17.5)	22 (6.5)	23 (6.5)
	4-3	63 (17.5)	13 (5.5)	12 (3.5)
	5-4	45 (13.5)	8 (3.5)	7 (2.5)
	6-5	41 (11.5)		24 (12.5)
	7-6	18 (9.5)		38 (12.5)
	8-7	6 (3.5)		33 (10.5)
	9-8	22 (5.5)	14 (6.5)	40 (12.5)
	10-9	6 (7.5)		34 (10.5)
2	2-0	40 (11.5)	20 (6.5)	32 (9.5)
	3-1	53 (18.5)	20 (7.5)	33 (9.5)
	4-2	58 (19.5)	25 (8.5)	29 (10.5)
	5-3	62 (18.5)	22 (6.5)	19 (11.5)
	6-4	68 (19.5)	24 (7.5)	39 (12.5)
	7-5	69 (19.5)	24 (7.5)	31 (10.5)
	8-6	47 (13.5)	22 (7.5)	24 (10.5)
	9-7	45 (14.5)	19 (7.5)	29 (9.5)
	10-8	38 (10.5)	6 (4.5)	24 (6.5)
3	6-3	25 (7.5)		
	7-4	42 (12.5)	7 (3.5)	19 (7.5)
	8-5	48 (13.5)	11 (4.5)	29 (9.5)
	9-6	39 (12.5)	14 (5.5)	31 (9.5)

ozone and dissociated hydrogen together under carefully controlled conditions. The molecules were primarily created in the $v = 9$ vibrational energy level, and the other energy levels were populated as the molecules emit radiation. A low-dispersion plot of the spectrum is given in Figure 1 illustrating the band structure and the blackbody emission from the interferometer optics. A higher dispersion plot of the spectrum is given in Figure 2 illustrating several P lines of both the 1-0 and 2-1 bands. The spectrum is plotted on a linear-logarithmic scale that permits the display of high signal-to-noise ratio spectra. The most annoying feature of the spectrum is the sinc instrumental line shape which distorts all lines in the spectrum; this *ringing* occurred because the interferometer had insufficient resolution to resolve narrow spectral lines present in the diffusion flame.

A description of the spectrometer and the methods of data transformation and reduction have been presented earlier (Abrams et al. 1990). The interferometer was the 1 m Fourier transform spectrometer at the McMath Solar Telescope at the National Solar Observatory, Kitt Peak. An unapodized resolution width of 0.0096 cm^{-1} was used and the observed spectrum was calibrated against CO_2 lines present, as impurities, in the diffusion flame. The CO_2 lines were measured by Guelachvili et al. (1983); a correction factor of $1.000000715(205)$ was determined by Brown (1990) using 15 lines. The estimated absolute error is determined by the error in the line-fitting process which is not expected to exceed $(W/2)(\text{S}/\text{N})^{-1} \sim 0.25 \text{ mK}$, where W is the line width, and (S/N) is the signal-to-noise ratio which ranges from a minimum of 20 up to 5000.

3. DATA REDUCTION

The spectrum was reduced into a line list using the interactive data processing code DECOMP written by J. W. Brault and adapted for use with IBM PC-compatible computers (Brault & Abrams 1989). Each line was fitted with a Voigt function to obtain accurate estimates of the wavenumber, intensity, width, damping parameter, and the equivalent width. Unfortunately, due to the ringing present in the spectrum, this method proved unsatisfactory for two reasons: the ringing introduces 10–20 fictitious peaks for each strong line; and the instrumental line shape overwhelmed the expected Voigt shape, biasing the resultant line parameters. The distortion of the intensity, width, and damping was expected and should not have compromised the measurement of line positions, but in practice the Hamiltonian reduction of the line positions into molecular parameters failed to converge below 0.009 cm^{-1} . Upon closer analysis it became apparent that the instrumental line shape was the limiting factor in the analysis. Brault and Abrams developed a method for enhancing the resolution of Fourier transform spectra without compromising the signal-to-noise ratio or introducing computational artifacts (Abrams, Davis, & Brault 1989). The method is a simple variation on traditional least-squares fitting of line shapes to Voigt functions: after each iteration of fitting the underresolved line to a Voigt function, the residuals are filtered with a sharp cutoff function that matches the resolution of the interferometer. An example of the method in action is given in Figure 3—three features are worth noting: the only additional information used in the fitting process was the transform of the instrumen-

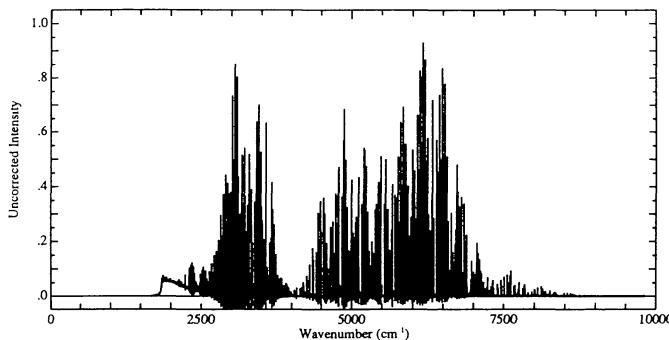


FIG. 1.—A low-dispersion spectrum of the ozone-hydrogen diffusion flame; bands in the $\Delta v = 1, 2$, and 3 vibrational sequences are recognizable. The continuum emission between 1850 and 2500 cm^{-1} is blackbody emission from the instrument and optics.

tal line shape function (the transfer function of the interferometer, nominally a sharp cutoff function), only the six distinct lines in Figure 3a were fitted (these being lines that were clearly recognizable as real lines), and the fitted spectrum in Figure 3b demonstrates that the strong lines have been more fully resolved and several new lines have appeared in the fitting resid-

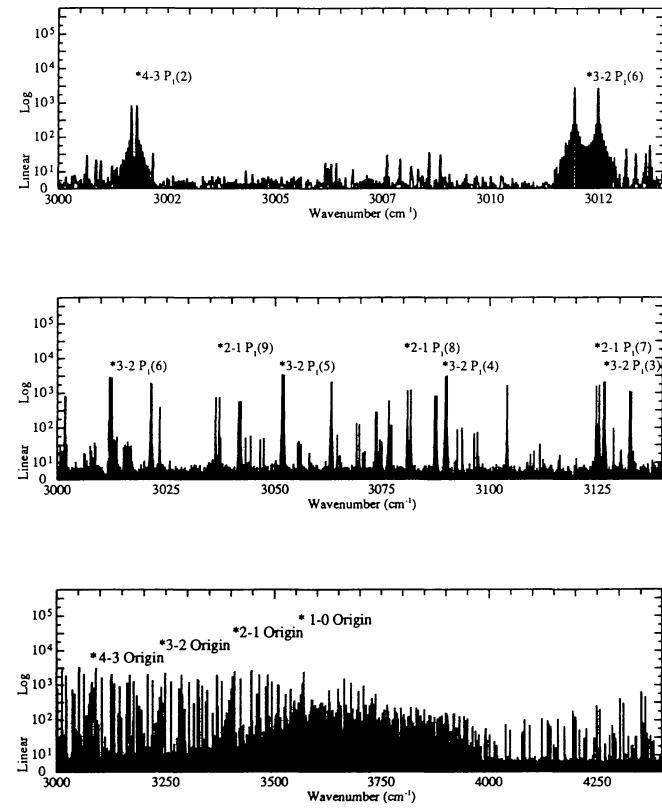


FIG. 2.—Intermediate-dispersion plots of the vibration rotation spectrum of OH: (top) spectrum plotted to illustrate ringing that dominates the appearance of strong OH lines; (middle) spectrum illustrating relative positions and strengths of branches in the $\Delta v = 1$ sequence; (bottom) spectrum illustrating the origins of the bands in the $\Delta v = 1$ vibrational sequence.

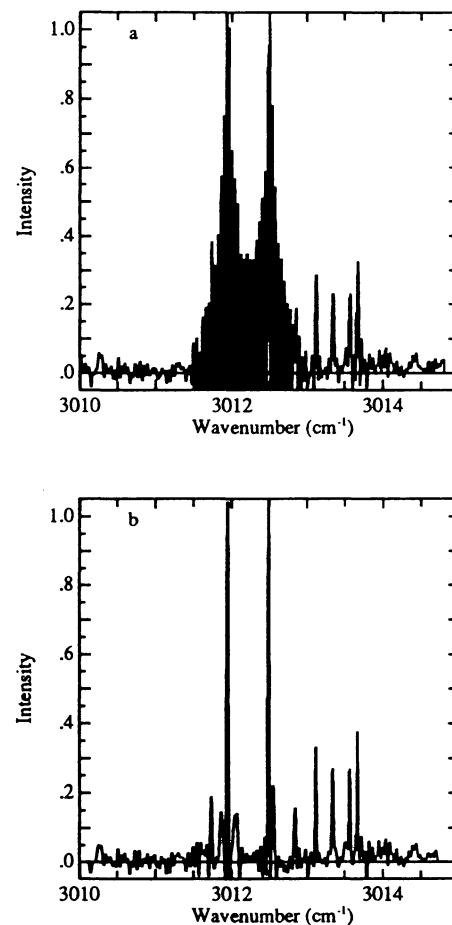


FIG. 3.—Typical example of the spectral fitting process: (a) raw spectrum before the instrumental distortion (ringing) is removed; (b) spectrum after least-squares fitting to remove ringing; notice in (b) that several lines that were obscured are now clearly visible.

TABLE 2
MATRIX ELEMENTS OF THE $^2\Pi_i$ HAMILTONIAN IN AN *e/f* SYMMETRIZED,
HUND'S CASE (a) BASIS SET FOR THE OH MOLECULE

$$\begin{aligned} \langle ^2\Pi_{1/2}|^2\Pi_{1/2}\rangle &= T - \frac{A}{2} + B(z+1) - D[(z+1)^2 + z] + H[(z+1)^3 + z(3z+1)] \\ &\quad - L[(z+1)^4 + z(6z^2 + 5z + 2)] - \frac{1}{2}A_D(z+1) \\ &\quad - \frac{1}{4}A_H[3(z+1)^2 + z] + \frac{p}{2}[1 \mp (J + \frac{1}{2})] + \frac{q}{2}[z + 2 \pm (J + \frac{1}{2})] \\ \langle ^2\Pi_{3/2}|^2\Pi_{3/2}\rangle &= T + \frac{A}{2} + B(z-1) - D[(z-1)^2 + z] + H[(z-1)^3 + z(3z-1)] \\ &\quad - L[(z-1)^4 + z(6z^2 - 3z + 2)] + \frac{1}{2}A_D(z-1) \\ &\quad + \frac{1}{4}A_H[3(z-1)^2 + z] + \frac{q}{2}z \\ \langle ^2\Pi_{1/2}|^2\Pi_{3/2}\rangle &= -\sqrt{z}[B - 2Dz + H(3z^2 + z + 1) - L[4z(z^2 + z + 1)] \\ &\quad - \frac{A_H}{2} + \frac{p}{2} - \frac{q}{2}[-1 \pm (J + \frac{1}{2})]] \end{aligned}$$

^a The matrix elements are given for the *e* and *f* parity sublevels with $z = (J - \frac{1}{2})(J + \frac{3}{2})$. When a sign is given, the upper sign refers to the *e* sublevels and the lower one refers to the *f* sublevels.

TABLE 3
OBSERVED LINE POSITIONS OF 1-0 BAND OF OH

J	R1e	O-C	R1f	O-C	R2e	O-C	R2f	O-C
1.5	3649.2014	24	3649.3325	21	3627.7493	0	3627.8421	-6
2.5	3659.3850	-3	3679.5016	-6	3697.3143	-8	3663.7210	-34
3.5	3708.7018	-6	3708.9973	-7	3726.6258	1	3697.2254	10
4.5	3716.9381	-9	3737.3021	-6	3757.5396	13	3726.4518	11
5.5	3733.9021	-8	3764.3246	-5	3784.5942	84	3759.5623	6
6.5	3789.4438	-6	3789.9137	15	3810.0836	-26	3809.7125	-16
7.5	3813.5597	20	3836.3684	78			3590.2116	-34
8.5							3614.4831	-38

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TABLE 4
OBSERVED LINE POSITIONS OF 2-1 BAND OF OH

A	B	C																																																																																																																																																																																																																																																																																																									
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<tr><td>7.5</td><td>3189.3943</td><td>-16</td><td>3188.4783</td><td>1</td><td>3145.4912</td><td>-3</td><td>3146.1836</td><td>-25</td></tr> <tr><td>9.5</td><td>3141.0414</td><td>-5</td><td>3096.4480</td><td>-2</td><td>3097.2359</td><td>-40</td><td>3097.2359</td><td>-40</td></tr> <tr><td>10.5</td><td>3033.7146</td><td>-4</td><td>3046.5821</td><td>-3</td><td>3047.4591</td><td>-9</td><td>3047.4591</td><td>-4</td></tr> <tr><td>11.5</td><td>3044.4288</td><td>4</td><td>3043.2142</td><td>-9</td><td>2995.9251</td><td>-9</td><td>2996.7314</td><td>7</td></tr> <tr><td>12.5</td><td>2994.2621</td><td>9</td><td>2992.9481</td><td>8</td><td>2944.5108</td><td>21</td><td>2945.5700</td><td>29</td></tr> <tr><td>13.5</td><td>2943.2716</td><td>3</td><td>2941.8635</td><td>-22</td><td>2892.3836</td><td>25</td><td>2893.5308</td><td>44</td></tr> <tr><td>14.5</td><td>2894.5078</td><td>20</td><td>2890.0070</td><td>-30</td><td>2839.5801</td><td>36</td><td>2844.8197</td><td>9</td></tr> <tr><td>15.5</td><td>2839.0300</td><td>-21</td><td></td><td></td><td>2787.4645</td><td>50</td><td>2637.5432</td><td>1</td></tr> <tr><td>16.5</td><td></td><td></td><td></td><td></td><td>2733.5285</td><td>-60</td><td>2644.0014</td><td>-11</td></tr> <tr><td>17.5</td><td></td><td></td><td></td><td></td><td>2733.5285</td><td>-60</td><td>2644.0058</td><td>3</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td>17.5</td><td></td><td>2593.8583</td><td>-15</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td>18.5</td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td>19.5</td><td></td><td></td><td></td></tr> </tbody> </table>	J	P1e	O-C	P1f	O-C	P2e	O-C	P2f	O-C	1.5	3484.7474	7	3484.5976	8	3507.8609	32	3507.7547	0	2.5	3407.2220	10	3447.0108	11	3465.2668	46	3465.2462	27	3.5	3407.9877	6	3407.6110	13	3421.9310	23	3422.0147	2	4.5	3367.0375	3	3366.5476	12	3377.8870	12	3377.0772	3	5.5	3324.5765	0	3323.9765	10	3287.4773	0	3287.8765	-12	6.5	3225.6484	-1	3280.0358	-2	3241.0161	-4	3241.5153	-27	7.5	3189.3943	-16	3188.4783	1	3145.4912	-3	3146.1836	-25	9.5	3141.0414	-5	3096.4480	-2	3097.2359	-40	3097.2359	-40	10.5	3033.7146	-4	3046.5821	-3	3047.4591	-9	3047.4591	-4	11.5	3044.4288	4	3043.2142	-9	2995.9251	-9	2996.7314	7	12.5	2994.2621	9	2992.9481	8	2944.5108	21	2945.5700	29	13.5	2943.2716	3	2941.8635	-22	2892.3836	25	2893.5308	44	14.5	2894.5078	20	2890.0070	-30	2839.5801	36	2844.8197	9	15.5	2839.0300	-21			2787.4645	50	2637.5432	1	16.5					2733.5285	-60	2644.0014	-11	17.5					2733.5285	-60	2644.0058	3						17.5		2593.8583	-15						18.5									19.5				<table border="1"> <thead> <tr> <th>J</th> <th>R1e</th> 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1.5	3484.7474	7	3484.5976	8	3507.8609	32	3507.7547	0																																																																																																																																																																																																																																																																																																			
2.5	3407.2220	10	3447.0108	11	3465.2668	46	3465.2462	27																																																																																																																																																																																																																																																																																																			
3.5	3407.9877	6	3407.6110	13	3421.9310	23	3422.0147	2																																																																																																																																																																																																																																																																																																			
4.5	3367.0375	3	3366.5476	12	3377.8870	12	3377.0772	3																																																																																																																																																																																																																																																																																																			
5.5	3324.5765	0	3323.9765	10	3287.4773	0	3287.8765	-12																																																																																																																																																																																																																																																																																																			
6.5	3225.6484	-1	3280.0358	-2	3241.0161	-4	3241.5153	-27																																																																																																																																																																																																																																																																																																			
7.5	3189.3943	-16	3188.4783	1	3145.4912	-3	3146.1836	-25																																																																																																																																																																																																																																																																																																			
9.5	3141.0414	-5	3096.4480	-2	3097.2359	-40	3097.2359	-40																																																																																																																																																																																																																																																																																																			
10.5	3033.7146	-4	3046.5821	-3	3047.4591	-9	3047.4591	-4																																																																																																																																																																																																																																																																																																			
11.5	3044.4288	4	3043.2142	-9	2995.9251	-9	2996.7314	7																																																																																																																																																																																																																																																																																																			
12.5	2994.2621	9	2992.9481	8	2944.5108	21	2945.5700	29																																																																																																																																																																																																																																																																																																			
13.5	2943.2716	3	2941.8635	-22	2892.3836	25	2893.5308	44																																																																																																																																																																																																																																																																																																			
14.5	2894.5078	20	2890.0070	-30	2839.5801	36	2844.8197	9																																																																																																																																																																																																																																																																																																			
15.5	2839.0300	-21			2787.4645	50	2637.5432	1																																																																																																																																																																																																																																																																																																			
16.5					2733.5285	-60	2644.0014	-11																																																																																																																																																																																																																																																																																																			
17.5					2733.5285	-60	2644.0058	3																																																																																																																																																																																																																																																																																																			
					17.5		2593.8583	-15																																																																																																																																																																																																																																																																																																			
					18.5																																																																																																																																																																																																																																																																																																						
					19.5																																																																																																																																																																																																																																																																																																						
J	R1e	O-C	R1f	O-C	R2e	O-C	R2f	O-C																																																																																																																																																																																																																																																																																																			
.5	3456.4152	6	3568.5220	4	3568.9053	9	3569.2148	-4																																																																																																																																																																																																																																																																																																			
1.5	3565.2801	-1	3565.6679	-9	3562.1692	-19	3562.7081	-33																																																																																																																																																																																																																																																																																																			
2.5	3560.7295	0	3561.5949	-8	3556.6162	73	3556.9946	-19																																																																																																																																																																																																																																																																																																			
3.5	3554.7194	0	3556.2629	-75	3549.1129	-21	3545.7129	46																																																																																																																																																																																																																																																																																																			
4.5	3547.2334	-28	3549.5309	-111	3541.4562	-2	3539.3208	4.5																																																																																																																																																																																																																																																																																																			
5.5	3538.2338	51	3541.6732	-32			3381.9455	5.5																																																																																																																																																																																																																																																																																																			
J	Q1e	O-C	Q1f	O-C	Q2e	O-C	Q2f	O-C																																																																																																																																																																																																																																																																																																			
.5	3402.8231	-3	3402.9216	-6	3400.0853	-1	3400.7478	13																																																																																																																																																																																																																																																																																																			
1.5	3499.7266	2	3496.6831	-5	3496.0470	-8	3396.6831	61																																																																																																																																																																																																																																																																																																			
2.5	3495.2409	10	3390.4904	11	3391.2234	-23	3391.2234	-23																																																																																																																																																																																																																																																																																																			
3.5	3389.3208	20	3384.1880	-5	3384.3909	17	3384.4300	-21																																																																																																																																																																																																																																																																																																			
4.5	3381.9455	34	3373.1161	-14	3376.3205	5																																																																																																																																																																																																																																																																																																					

TABLE 5
OBSERVED LINE POSITIONS OF 3-2 BAND OF OH

J	R1e	O-C	R1f	O-C	R2e	O-C	R2f	O-C
1.5	3161.4266	7	3161.2987	0	3183.5760	1	3183.4729	4
2.5	3126.6054	-7	3126.3761	13	3104.0393	-24	3104.1052	-45
3.5	3090.1026	-13	3089.7669	23	3063.0564	21	3063.2392	4
4.5	3052.0318	-19	3051.9810	28	3021.2831	13	3021.5325	-2
5.5	3012.4886	-27	3011.9445	30	2978.6801	15	2979.0310	-7
6.5	2971.6201	-30	2970.9749	28	2935.2235	10	2935.6716	-11
7.5	2939.5192	-18	2928.7747	20	2891.9028	1	2891.4426	-16
8.5	2886.2736	-18	2885.3131	8	2845.7222	-8	2846.3520	-12
9.5	2841.0598	-1	2841.0211	-11	2799.6991	-38	2800.4550	5
10.5	2796.6454	22	2795.6112	-31	2752.8506	-19	2753.5659	18
11.5	2750.5927	36	2749.2631	-52	2705.2109	0	2706.1060	28
12.5	2703.2525	89	2702.0302	-39	2657.8141	15	2657.7956	22
13.5	2655.2866	77	2653.9738	-69	2607.6959	24	2608.7526	-5
14.5	2606.5414	14	2605.1360	-57	2557.8929	33	2559.0342	-81
15.5	2557.0590	-77	2555.5629	18	2508.6559	-233	2516.6755	0
16.5	2506.8887	-276	2505.5110	55	2456.3656	224	2457.6620	-512
17.5	2456.6887	-276	2455.3110	55	2406.6556	224	2407.6250	-512

B

J	R1e	O-C	R1f	O-C	R2e	O-C	R2f	O-C
1.5	3314.0570	-3	3314.1376	14	3293.5705	-2	3293.6577	-11
2.5	3341.8629	-10	3341.8691	9	3326.4898	-46	3326.4898	59
3.5	3368.4173	-14	3368.6749	3	3385.7608	15	3385.6107	18
4.5	3394.0556	-25	3394.3715	27	3412.2618	59	3412.0545	-52
5.5	3418.4325	-37	3418.7950	66	3436.7942	79		
6.5	3441.8116	106						

C

J	R1e	O-C	R1f	O-C	R2e	O-C	R2f	O-C
1.5	3239.1508	12	3239.2429	-4	3239.6493	-11	3239.9280	-4
2.5	3236.0820	8	3236.4135	8	3233.1030	12	3233.6105	7
3.5	3231.6458	-9	3232.3919	2	3227.3119	-4	3228.0491	115
4.5	3225.7940	-9	3227.3119	-4	3220.6083	-71		
5.5	3218.5038	15						
6.5	3209.7698	54						

TABLE 6
OBSERVED LINE POSITIONS OF 4-3 BAND OF OH

J	P1e	O-C	P1f	O-C	P2e	O-C	P2f	O-C
1.5	3161.4266	7	3161.2987	0	3183.5760	1	3183.4729	4
2.5	3126.6054	-7	3126.3761	13	3104.0393	-24	3104.1052	-45
3.5	3090.1026	-13	3089.7669	23	3063.0564	21	3063.2392	4
4.5	3052.0318	-19	3051.9810	28	3021.2831	13	3021.5325	-2
5.5	3012.4886	-27	3011.9445	30	2978.6801	15	2979.0310	-7
6.5	2971.6201	-30	2970.9749	28	2935.2235	10	2935.6716	-11
7.5	2939.5192	-18	2928.7747	20	2891.9028	1	2891.4426	-16
8.5	2886.2736	-18	2885.3131	8	2845.7222	-8	2846.3520	-12
9.5	2841.0598	-1	2841.0211	-11	2799.6991	-38	2800.4550	5
10.5	2796.6454	22	2795.6112	-31	2752.8506	-19	2753.5659	18
11.5	2750.5927	36	2749.2631	-52	2705.2109	0	2706.1060	28
12.5	2703.2525	89	2702.0302	-39	2657.8141	15	2657.7956	22
13.5	2655.2866	77	2653.9738	-69	2607.6959	24	2608.7526	-5
14.5	2606.5414	14	2605.1360	-57	2557.8929	33	2559.0342	-81
15.5	2557.0590	-77	2555.5629	18	2508.6559	-233	2516.6755	0
16.5	2506.8887	-276	2505.5110	55	2456.3656	224	2457.6620	-512
17.5	2456.6887	-276	2455.3110	55	2406.6556	224	2407.6250	-512

A

J	P1e	O-C	P1f	O-C	P2e	O-C	P2f	O-C
1.5	3161.4266	7	3161.2987	0	3183.5760	1	3183.4729	4
2.5	3126.6054	-7	3126.3761	13	3104.0393	-24	3104.1052	-45
3.5	3090.1026	-13	3089.7669	23	3063.0564	21	3063.2392	4
4.5	3052.0318	-19	3051.9810	28	3021.2831	13	3021.5325	-2
5.5	3012.4886	-27	3011.9445	30	2978.6801	15	2979.0310	-7
6.5	2971.6201	-30	2970.9749	28	2935.2235	10	2935.6716	-11
7.5	2939.5192	-18	2928.7747	20	2891.9028	1	2891.4426	-16
8.5	2886.2736	-18	2885.3131	8	2845.7222	-8	2846.3520	-12
9.5	2841.0598	-1	2841.0211	-11	2799.6991	-38	2800.4550	5
10.5	2796.6454	22	2795.6112	-31	2752.8506	-19	2753.5659	18
11.5	2750.5927	36	2749.2631	-52	2705.2109	0	2706.1060	28
12.5	2703.2525	89	2702.0302	-39	2657.8141	15	2657.7956	22
13.5	2655.2866	77	2653.9738	-69	2607.6959	24	2608.7526	-5
14.5	2606.5414	14	2605.1360	-57	2557.8929	33	2559.0342	-81
15.5	2557.0590	-77	2555.5629	18	2508.6559	-233	2516.6755	0
16.5	2506.8887	-276	2505.5110	55	2456.3656	224	2457.6620	-512
17.5	2456.6887	-276	2455.3110	55	2406.6556	224	2407.6250	-512

B

J	R1e	O-C	R1f	O-C	R2e	O-C	R2f	O-C
1.5	3314.0570	-3	3314.1376	14	3293.5705	-2	3293.6577	-11
2.5	3341.8629	-10	3341.8691	9	3326.4898	-46	3326.4898	59
3.5	3368.4173	-14	3368.6749	3	3385.7608	15	3385.6107	18
4.5	3394.0556	-25	3394.3715	27	3412.2618	59	3412.0545	-52
5.5	3418.4325	-37	3418.7950	66	3436.7942	79		
6.5	3441.8116	106						

C

J	Q1e	O-C	Q1f	O-C	Q2e	O-C	Q2f	O-C
1.5	3239.1508	12	3239.2429	-4	3239.6493	-11	3239.9280	-4
2.5	3236.0820	8	3236.4135	8	3233.1030	12	3233.6105	7
3.5	3231.6458	-9	3232.3919	2	3227.3119	-4	3228.0491	115
4.5	3225.7940	-9	3227.3119	-4	3220.6083	-71		
5.5	3218.5038	15						
6.5	3209.7698	54						

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TABLE 7
OBSERVED LINE POSITIONS OF 5-4 BAND OF OH

J	P1e	O-C	P1f	O-C	P2e	O-C	P2f	O-C
1.5	2842.2536	14	2842.1440	12	2863.3369	13	2863.2397	6
2.5	2809.9684	14	2809.7707	8	2789.9551	55	2789.9978	59
4.5	2776.0996	18	2775.8072	2	2751.9071	6	2752.0380	0
5.5	2740.7198	6	2743.3289	0	2712.9899	6	2713.2106	-9
6.5	2703.9228	4	2703.4351	0	2673.1985	11	2673.5081	-13
7.5	2665.8077	-2	2665.2230	9	2632.5229	4	2632.9180	-4
8.5	2626.4615	6	2625.7837	10	2590.9558	24	2591.4374	11
9.5	2585.9650	10	2585.1939	15	2548.5076	24	2549.0734	25
10.5	2544.3865	17	2543.5232	15	2505.1905	16	2505.8397	40
11.5	2501.7884	11	2500.8336	-5	2461.0258	-20	2461.7585	34
12.5	2458.2237	13	2457.1839	-71				
13.5			2412.6122	-136				

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TABLE 8
OBSERVED LINE POSITIONS OF 6-5 BAND OF OH

J	R1e	O-C	R1f	O-C	R2e	O-C	R2f	O-C
.5	2983.0705	-188	2983.0705	731	2963.6656	12	2963.7412	0
1.5	3008.1719	-148	3008.1719	999	2993.5179	1		
2.5								
J	Q1e	O-C	Q1f	O-C	Q2e	O-C	Q2f	O-C
.5	2914.0996	201	2914.1748	98	2914.5742	-185	2914.8180	144
2.5	2911.0384	-145	2911.3186	-168				
3.5	2906.6271	144	2907.2388	70				

TABLE 9
OBSERVED LINE POSITIONS OF 7-6 BAND OF OH

A						B											
J	R1e	O-C	R1f	O-C	R2e	O-C	R2f	O-C	J	R1e	O-C	R1f	O-C	R2e	O-C	R2f	O-C
4.5	2456.9360	-14	2435.6018	0	2435.7002	31	2.5	2350.7401	-395	2350.6592	-395	3.5	2322.2405	605	2322.0898	605	
5.5	2423.9874	-6	2399.3602	23	2362.4162	20	7.5	2354.4375	9	2323.9159	22	2323.9906	-24	2324.3302	-12	2325.2788	-2
6.5	2389.6210	10	2362.1574	0	2362.4162	20	8.5	2317.5580	12	2316.9481	16	2285.2788	-2				
7.5	2353.9159	22	2323.9906	-24			9.5	2279.4826	-2	2278.7500	37						
1.5	2647.2127	28	2647.2951	-30	2655.5793	53	1.5	2473.3190	18	2480.5567	-29	2480.5567	-14				
2.5	2669.6280	-1	2659.7488	42	2680.2393	-48	2.5	2494.2795	8	2503.5247	-12	2503.4707	-25				
3.5	2690.9204	33	2691.0940	12	2702.8760	-13	3.5	2514.0382	2	2514.1856	18	2524.4645	-4	2524.3571	-19		
4.5	2710.9829	3	2711.1939	4	2723.5279	-1	4.5	2532.6690	9								
5.5	2729.6833	18	2739.9265	2	2742.0321	-25	5.5	2549.7193	-5	2549.7193	0	2565.1266	0	2565.0674	14		
6.5	2746.9177	0	2747.1808	-2	2759.0088	-38	6.5	2555.5144	-5	2555.0081	-5	2575.2855	35	2575.2672	48	2588.0304	32
7.5	2762.5837	4	2762.8886	6	2773.8645	-7	7.5	2680.1816	0	2680.1816	-5	2579.0956	-16	2588.2672	48	2599.0132	40
8.5	2776.6005	1	2776.8819	-21	2786.8038	-19	8.5	2702.7616	22	2723.3658	7	2591.2391	-34	2599.2585	61	2599.0132	40
9.5	2788.8977	-33	2789.1705	-6	2797.8035	4	9.5	2723.5279	-1	2742.0281	-15	2601.3744	-65	2608.2363	59	2607.9837	112
10.5							10.5	2723.5279	-1	2758.0700	-7	2610.1458	-100				
11.5							11.5										
12.5							12.5										

TABLE 10
OBSERVED LINE POSITIONS OF 8-7 BAND OF OH

A					
J	R1e	O-C	R1f	O-C	R2e
4.5	2435.6018	0	2435.7002	31	2.5
5.5	2399.3602	23	2362.4162	20	3.5
6.5	2362.1574	0	2362.4162	-12	3.5
7.5	2323.9906	-24	2324.3302	-12	7.5
8.5	2323.9906	-24	2324.3302	-12	8.5
9.5	2285.2788	-2	2285.2788	-2	9.5
J	R1e	O-C	R1f	O-C	R2e
1.5	2473.3190	18	2480.5567	-29	2480.5567
2.5	2494.2795	8	2503.5247	-12	2503.4707
3.5	2514.0382	2	2514.1856	18	2524.4645
4.5	2532.6690	9	2532.6690	-4	2524.3571
5.5	2549.7193	-5	2549.7193	0	
6.5	2555.5144	-5	2555.5144	-5	
7.5	2565.1266	0	2565.1266	0	
8.5	2575.2855	35	2575.2855	35	
9.5	2588.2672	48	2588.2672	48	
10.5	2599.0132	40	2599.0132	40	
11.5	2607.9837	112	2607.9837	112	
12.5					

TABLE II
OBSERVED LINE POSITIONS OF 9–8 BANDS OF OH

A						B						C					
J	P1e	O–C	P1f	O–C	P2e	O–C	P2f	O–C	J	R1e	O–C	R1f	O–C	R2e	O–C	R2f	O–C
1.5	2176.2714	-63	2176.1986	-52	2194.5152	-24	2194.4361	-42	2.5	2105.6397	-30						
2.5	2148.7953	-24	2148.6618	-46	2133.0475	23	2133.0475	24	3.5	2124.7677	4						
3.5	2149.7768	-21	2149.5647	-6	2100.4449	-42	2100.4965	42	4.5	2141.7145	105						
4.5	2089.2246	57	2088.9340	48	2066.6637	27	2066.7868	62	5.5	2156.5106	-36						
5.5									7.5	2169.1250	-107						
										2179.5403	65						

TABLE I2
OBSERVED LINE POSITIONS OF 10–9 BAND OF OH

A						B						C					
J	P1e	O–C	P1f	O–C	P2e	O–C	P2f	O–C	J	P1e	O–C	P1f	O–C	P2e	O–C	P2f	O–C
.5	2292.32276	-25	2292.38116	-32	2275.1445	-2	2275.1884	-62	1.5	2101.0618	-36	2105.6412	-87	2105.6412	-164		
2.5	2311.7170	8	2311.8067	0	2319.4706	40	2319.4126	-2	2.5	2118.6936	119	2118.7818	-56	2124.7692	-52	2124.7692	
3.5	2329.7972	51	2329.9205	24	2338.5395	58	2338.4327	25	3.5	2134.8956	14	2134.9956	14	2141.7160	62	2141.7160	-49
4.5	2346.4692	71	2346.6166	42	2355.5388	59	2355.51907	40	4.5	2149.6602	48	2149.6602	7	2156.5122	-15	2156.5122	94
5.5	2361.6201	79	2361.7838	33	2370.4761	43	2370.2966	28	5.5	2162.5410	9	2162.6596	-33	2169.1266	-56	2169.1266	-8
6.5	2375.1438	56	2375.3130	7	2383.3535	-2	2383.1510	0	6.5	2173.7709	-69	2173.8807	-77	2179.5419	-31	2179.5419	-94
7.5	2386.9401	5	2387.1053	-39	2384.1573	-40	2383.9411	-26	7.5	2183.1236	-103	2183.2189	-122				
8.5	2396.9180	-68	2397.0683	-81	2402.8635	-42	2402.6464	-64	8.5	2190.5004	-90	2190.5721	-134				
9.5	2404.9916	-138	2405.1179	-102	2409.4375	26	2409.2244	-8	9.5	2195.8101	-59	2195.8101	255				
10.5	2411.0796	-164	2411.1707	-28					10.5	2198.9443	166	2198.9443	27				
11.5	2415.0990	-45	2415.2266	-603													
12.5	2416.9686	331	2416.9686	720													

TABLE 13
OBSERVED LINE POSITIONS OF 2-0 BAND OF OH

J	R1e	O-C	R1f	O-C	R2e	O-C	R2f	O-C	R1e	O-C	R1f	O-C	R2e	O-C	R2f	O-C
.5	7049.1184	-14	7049.2349	-13	7028.7490	-6	7028.8318	-20								
2.5	7075.0449	-12	7075.2315	-15	7088.7194	-5	7088.6337	-13								
3.5	7098.7676	-8	7099.0139	-23	7112.0295	-2	7112.8700	0								
4.5	7120.0437	-2	7120.3333	-6	7133.7707	8	7133.5334	2								
5.5	7138.6700	6	7138.9909	-4	7151.0766	19	7150.8142	17								
6.5	7154.939	6	7154.8316	10	7165.0360	14	7164.793	34								
7.5	7167.3990	36	7167.7454	19	7175.7014	-22	7175.3856	-16								
8.5	7177.3047	70	7177.3047	19	7175.7014	-22	7175.3856	-16								
9.5	7184.1570	19														
C																
J	Q1e	O-C	Q1f	O-C	Q2e	O-C	Q2f	O-C	Q1e	O-C	Q1f	O-C	Q2e	O-C	Q2f	O-C
.5	6971.2909	-11	6971.3936	-14	6972.3770	-13	6972.6779	-15								
2.5	6965.1937	-6	6965.5674	-15	6959.1218	0	6959.6532	-17								
3.5	6956.3885	1	6957.2248	-18	6948.0271	19	6948.4046	-60								
4.5	6944.7833	18	6946.2719	-15												
5.5	6930.3339	29	6932.6518	-7												
6.5	6913.0241	42	6916.3410	-46												

TABLE 14
OBSERVED LINE POSITIONS OF 3-1 BAND OF OH

J	P1e	O-C	P1f	O-C	P2e	O-C	P2f	O-C	J	P1e	O-C	P1f	O-C	P2e	O-C	P2f	O-C	
1.5	6887.6230	-9	6887.4688	-5	6911.3337	-2	6911.2173	-5	1.5	6561.3411	-6	6561.1976	-1	6584.5761	-9	6584.4610	7	
2.5	6847.1863	-1	6846.9106	1	6818.8863	16	6818.9623	-6	2.5	6522.2374	-6	6522.0055	8	6495.4421	0	6495.5079	-18	
3.5	6803.6472	2	6803.2407	6	6769.2918	18	6769.4831	2	4.5	6880.1675	-7	6479.7825	18	6447.4602	17	6447.6359	8	
4.5	6757.1028	6	6756.5629	8	6717.8011	-1	6717.8011	-1	5.5	6335.1274	-12	6434.0122	28	6395.5563	7			
5.5	6707.0822	6	6707.0076	11	6663.4590	7	6663.8885	-5	6.5	6387.2567	-14	6386.6105	34	6344.8414	19	6345.2479	-2	
6.5	6655.5101	8	6654.7012	7	6607.1775	0	6607.7269	-11	7.5	6336.6701	-16	6335.8915	35	6290.1793	16	6290.7034	-11	
8.5	6600.6987	8	6599.7539	6	6548.6426	-2	6559.3140	-19	8.5	6283.4722	-19	6282.5599	25	6233.2793	0	6233.9215	-19	
9.5	6543.4964	0	6542.2629	11	6487.8694	-22	6487.8694	-22	9.5	6227.7545	-11	6226.7071	12	6177.1531	-20			
10.5	6483.3383	3	6482.3192	-20	6424.8831	-60	6425.7985	-44	10.5	6169.6009	-4	6168.4168	-16	6112.8263	-56	6113.701	-36	
11.5	6421.3581	-31	6419.9987	-60	6360.7579	-83	6360.7579	-83	11.5	6107.7626	-17	6049.3255	-79	6050.3344	-22			
										12.5	6046.2786	28	6044.0140	-51	5983.6958	-64	5917.2254	88
										13.5	5981.2458	38	5979.0375	-51			5847.5984	-19
B																		
J	R1e	O-C	R1f	O-C	R2e	O-C	R2f	O-C	R1e	O-C	R1f	O-C	R2e	O-C	R2f	O-C		
.5	7028.7490	-13	7049.2349	-13	7060.6725	-2	7060.6725	-27										
2.5	7075.0449	-12	7075.2315	-15	7088.7194	-5	7088.6337	-13										
3.5	7098.7676	-8	7099.0139	-23	7112.0295	-2	7112.8700	0										
4.5	7120.0437	-2	7120.3333	-6	7133.7707	8	7133.5334	2										
5.5	7138.6700	6	7138.9909	-4	7151.0766	19	7150.8142	17										
6.5	7154.939	6	7154.8316	10	7165.0360	14	7164.793	34										
7.5	7167.3990	36	7167.7454	19	7175.7014	-22	7175.3856	-16										
8.5	7177.3047	70	7177.3047	19	7175.7014	-22	7175.3856	-16										
9.5	7184.1570	19																
C																		
J	Q1e	O-C	Q1f	O-C	Q2e	O-C	Q2f	O-C	Q1e	O-C	Q1f	O-C	Q2e	O-C	Q2f	O-C		
.5	6971.2909	-11	6971.3936	-14	6972.3770	-13	6972.6779	-15										
2.5	6965.1937	-6	6965.5674	-15	6959.1218	0	6959.6532	-17										
3.5	6956.3885	1	6957.2248	-18	6948.0271	19	6948.4046	-60										
4.5	6944.7833	18	6946.2719	-15														
5.5	6930.3339	29	6932.6518	-7														
6.5	6913.0241	42	6916.3410	-46														
C																		
J	Q1e	O-C	Q1f	O-C	Q2e	O-C	Q2f	O-C	J	Q1e	O-C	Q1f	O-C	Q2e	O-C	Q2f	O-C	
.5	6971.2909	-11	6971.3936	-14	6967.2880	6	6967.7871	6										
2.5	6965.1937	-6	6965.5674	-15	6959.1218	0	6959.6532	-17										
3.5	6956.3885	1	6957.2248	-18	6948.0271	19	6948.4046	-60										
4.5	6944.7833	18	6946.2719	-15														
5.5	6930.3339	29	6932.6518	-7														
6.5	6913.0241	42	6916.3410	-46														

TABLE 15
OBSERVED LINE POSITIONS OF 4-2 BAND OF OH

TABLE 16
OBSERVED LINE POSITIONS OF 5-3 BAND OF OH

J	R1e	O-C	R1f	O-C	R2e	O-C	R2f	O-C	R1e	O-C	R1f	O-C	R2e	O-C	R2f	O-C
1.5	6238.0469	-11	6237.9145	-14	6260.7790	-9	6260.6681	-7	2.5	5879.2109	-6	5855.3418	-24	5855.3776	31	
3.5	6200.2853	-16	6200.0420	0	6159.2022	8	6128.4362	9	4.5	5840.0448	13	5839.7011	-5	5810.3966	0	
4.5	6159.5713	-11	6159.0723	8	6079.7723	10	6029.2544	4	5.5	5797.5962	23	5797.3208	-9	5763.1821	0	
5.5	6115.4753	-11	6115.4753	16	6078.8724	6	5976.2276	-5	7.5	5752.7753	24	5752.1838	-8	5713.7067	-4	
6.5	6069.1649	-9	6069.9463	20	6075.7311	0	5920.9641	-14	8.5	5704.0725	21	5653.9263	-4	5662.4391	1	
7.5	6020.4724	-8	6019.7228	19	5967.9041	10	5863.7768	-18	9.5	5631.9648	16	5600.9834	1	5608.5631	-3	
8.5	5968.7842	-5	5968.7842	-1	5913.5736	-4	5862.9103	-44	10.5	5516.7140	-1	5495.2970	12	5532.4473	-4	
9.5	5914.5873	2	5857.9599	2	5852.8110	-29	5812.9043	-44	11.5	5489.0863	-10	5487.8322	16	5432.6474	0	
10.5	5798.9722	10	5797.6897	23	5736.2626	-39	5741.9313	-45	12.5	5429.1430	-21	5427.7503	16	5369.8345	-9	
11.5	5737.6897	23	5676.8359	7	5677.9287	7	5611.0313	15	13.5	5366.9416	-54	5365.4051	18	5104.8817	0	
12.5	5674.1749	24	5672.6039	-4	5610.6132	80	5643.6755	9	14.5	5302.5343	-121	5300.0516	-16	5237.8403	-141	
13.5	5608.1749	117	5605.7682	71	5538.8130	187	5473.4924	81	15.5	5235.9672	-203	5234.1360	-77	5168.7212	-233	
14.5	5540.6691	50	5470.7893	18	5468.7744	540	5405.7251	97	16.5	5167.2838	-297	5165.3147	-293	5097.5751	-444	
15.5	5325.0127	-65	5398.8975	-9	5396.7251	944	5322.6974	999	17.5	5096.5493	-651	5094.4034	-423	5024.4205	-701	
16.5	5249.2038	-111							18.5	5023.7557	-819	5021.4716	-804	5026.1287	-563	

J	R1e	O-C	R1f	O-C	R2e	O-C	R2f	O-C	R1e	O-C	R1f	O-C	R2e	O-C	R2f	O-C
.5					6368.3803	-6	6368.4358	-17	1.5	6040.8675	23	6040.9378	-7			
1.5					6397.3144	-11	6422.5031	18	2.5	6068.3060	15	6068.3060	-7			
2.5	6432.3617	-11	6451.3739	11	6462.4577	14	6462.3679	18	3.5	6139.4013	-6	6092.1123	-9	6092.0510	-5	
3.5	6451.1317	-6	6467.5479	15	6477.3076	10	6477.0813	5	5.5	6133.9943	26	6112.3895	16	6112.2613	-15	
4.5	6467.2836	-3	6480.9433	11	6488.8715	8	6488.6189	19	6.5	6146.0407	38	6146.2783	-7	6129.0461	-2	
5.5	6480.6762	-8	6491.1993	0	6491.4466	14	6496.9274	5	7.5	6155.2175	47	6159.9031	-79	6159.6607	-32	
6.5					6499.0235	-4	6502.2896	-14	8.5	6161.4414	49	6163.6383	-4	6163.3996	29	
7.5					6503.5600	7	6504.1722	-50	9.5	6164.6477	5	6161.7827	-59	6163.9373	-52	
8.5					6505.0128	25			10.5							

J	Q1e	O-C	Q1f	O-C	Q2e	O-C	Q2f	O-C	J	Q1e	O-C	Q1f	O-C	Q2e	O-C	Q2f	O-C
1.5	6315.7718	-13	6315.8585	-17	6316.8513	-12	6317.1233	-17	1.5	5990.7183	-3	5990.7972	-4	5991.7698	5	5992.0257	4
2.5	6309.7626	-10	6310.0801	-12	6303.9058	-3	6312.3629	-8	2.5	5984.0707	-6	5984.9972	2	5985.8607	8	5987.2337	7
3.5	6301.1146	-7	6301.8918	-9	6291.0251	-5	6279.4102	0	3.5	5976.0708	-9	5976.7298	10	5968.0977	6	5968.4527	-10
4.5	6289.1369	7	6277.6052	-5	6261.5294	25			4.5	5964.7216	-14	5965.9095	15	5954.4695	-15	5954.5581	0
5.5	6275.5822	13	6277.6052	-5	6244.7919	5	6244.7919	5	6.5	5950.6064	-10	5952.4767	24				
7.5	6238.8669	42	6238.8669	26	6221.3809	26			8.5	5933.7014	-6	5936.3973	19				

TABLE 17
OBSERVED LINE POSITIONS OF 6-4 BAND OF OH

TABLE 18
OBSERVED LINE POSITIONS OF 7-5 BAND OF OH

J	R1e	O-C	R1f	O-C	R2e	O-C	R2f	O-C
1.5	5592.8043	0	5592.6920	-11	5614.4083	29	5614.3029	26
2.5	5597.5251	1	5592.3145	-5	5579.7925	15	5575.7431	24
3.5	5519.3834	1	5519.0605	4	5491.1224	-62	5491.6572	84
4.5	5478.4660	5	5477.6644	9	5445.2641	-23	5445.4492	-9
5.5	5434.0494	7	5437.0954	14	5397.4292	-15	5346.6326	2
6.5	5388.6248	8	5387.5338	17	5346.8755	19	5324.4251	-7
7.5	5339.1788	7	5338.3584	17	5293.1718	-348	5019.1880	4
8.5	5287.5947	5	5286.6421	4	5238.8383	19	5229.5008	4
9.5	5233.5375	10	5232.4509	-28	5181.5374	60	5182.3160	20
10.5	5177.0690	-6	5175.8431	-81	5122.8330	25	4915.5460	9
11.5	5118.2424	-46	5116.8773	-216	5060.2354	19	5061.2557	6
12.5	5057.1057	110	5055.5961	-391	4996.2844	-92	4931.4426	-200
13.5	4928.0822	-458	4992.0443	-637	4930.1718	-348	4861.9058	-667
14.5	4860.2736	-817	4858.3094	-999	4791.5391	-999	4793.0859	-925
15.5	4790.3165	-999	4788.1921	-999	4720.7669	-999	4656.4201	33
16.5	4718.2767	-999	4715.9413	-999	4616.3678	-999	4544.4613	-960
17.5	4644.0362	-999	4567.7657	-999	4599.9038	-999	4474.6520	-999
18.5							4402.6698	-999
19.5							4330.6827	-999

B

J	R1e	O-C	R1f	O-C	R2e	O-C	R2f	O-C
1.5	5730.6296	7	5730.7102	-5	5738.2044	41	5738.2105	-33
2.5	5751.4605	-1	5751.5854	19	5760.4183	-16	5779.1851	-19
3.5	5769.9662	12	5770.1314	10	5779.2845	-7	5779.1619	-4
4.5	5785.9784	10	5786.1678	15	5794.6340	-18	5794.4677	-11
5.5	5799.5357	13	5799.5365	11	5806.6338	-16	5816.4383	-18
6.5	5809.3064	10	5810.1051	2	5811.7694	-29	5815.1272	-20
7.5	5817.5816	26	5820.7775	23	5822.5526	-16	5820.7561	-33
8.5	5822.2813	0	5822.4459	-102	5821.9597	63	5824.0481	-58
9.5	5823.2925	-17	5822.4417	-790	5821.6938	999	5821.8840	-999
10.5							5478.2290	10.5
11.5	5817.8512	-193						
12.5	5809.7632	999						

C

J	Q1e	O-C	Q1f	O-C	Q2e	O-C	Q2f	O-C
1.5	5664.6534	-5	5664.7243	-2	5665.6463	24	5665.8861	33
2.5	5658.5975	-3	5658.8608	3	5660.7440	13	5661.1512	31
3.5	5649.5134	-1	5650.5140	13	5641.9366	-28	5642.2310	3
4.5	5638.5136	-5	5639.6009	18	5628.2434	-48	5628.3479	0
5.5	5624.3426	-5	5626.0608	19				
6.5	5607.7116	-5	5609.8563	0				
7.5	5587.5872	-5	5590.9609	-9				

TABLE 19
OBSERVED LINE POSITIONS OF 8–6 BAND OF OH

TABLE 20
OBSERVED LINE POSITIONS OF 9–7 BAND OF OH

A																	
J	P1e	O-C	P1f	O-C	P2e	O-C	P2f	O-C	J	P1e	O-C	R1f	O-C	P2e	O-C	P2f	O-C
1.5	4932.0245	9	4931.9296	16	4952.2046	14	4952.1030	15	1.5	4586.7175	-58	4586.6313	-43	4571.7771	-32	4605.8797	-62
2.5	4899.0056	5	4898.8245	7	4878.1985	-6	4878.1985	25	3.5	4554.7244	-27	4554.6594	-27	4534.6603	94	4534.6603	-93
3.5	4863.1152	2	4862.8344	-3	4837.2202	13	4837.2202	840	4.5	4519.7994	8	4519.5379	-1	4534.6603	94	4534.6603	-93
4.5	4824.3546	-11	4823.9607	-1	4793.7195	2	4793.8924	-3	5.5	4481.9306	39	4481.5607	19	4452.2323	67	4452.3694	36
6.5	4772.5787	-17	4782.2454	3	4737.7300	0	4747.9986	-2	6.5	4411.1390	56	4410.6508	39	4407.0277	73	4407.2557	44
7.5	4738.3805	-18	4737.7451	6	4699.2694	-1	4699.6389	0	7.5	4337.4616	56	4336.1481	43	4359.1996	58	4359.5248	38
8.5	4691.2766	-15	4690.5095	17	4648.3475	-1	4648.8235	-4	8.5	4350.9402	37	4350.1958	25	4308.7566	22	4309.1846	17
9.5	4611.5004	-6	4640.5993	21	4594.9724	-10	4595.5580	5	9.5	4301.6150	1	4300.7332	-3	4255.7009	-20	4256.2374	-9
10.5	4589.0599	8	4588.0597	22	4539.1518	-31	4539.8568	18	10.5	4249.5310	-45	4248.4961	-44	4200.6808	-1	4200.6808	-1
11.5	4514.1159	38	4513.9126	9	4480.8977	-123	4481.7118	-11	11.5	4194.6877	-94	4193.8063	-14	4141.7514	-94	4142.5190	-3
12.5	4476.5853	63	4475.2536	-34	4420.2057	-184	4421.1470	-13	12.5	4137.1324	-77	4135.8018	-60	4080.8405	17	4080.8405	17
13.5	4416.5377	71	4415.0512	-120	4358.1583	-37	4358.1583	-37	13.5	4076.8627	108	4075.3819	0	4012.2456	288	4012.2456	288

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B																	
J	R1e	O-C	R1f	O-C	R2e	O-C	R2f	O-C	J	R1e	O-C	R1f	O-C	R2e	O-C	R2f	O-C
.5	5057.6654	-31	5057.7256	-29	5040.3697	1	5040.4109	24	.5	4705.9523	-49	4705.9897	72	4709.7804	130	4689.1227	79
1.5	5055.5568	9	5075.6508	17	5081.8556	-14	5081.7832	-6	1.5	4722.1621	25	4722.4405	-1	4726.8064	20	4726.7234	0
3.5	5050.9498	-3	5091.0678	11	5097.2319	0	5097.1133	-7	3.5	4735.8201	23	4740.1527	124	4740.0366	-3	4740.1527	0
4.5	5103.6885	-10	5103.8176	5	5109.1011	-7	5109.9470	-5	4.5	4746.4955	65	4746.5909	37	4749.8958	62	4749.7405	28
5.5	5113.6260	-6	5113.7526	-2	5117.5107	0	5117.3382	-16	5.5	4754.3246	77	4754.4089	21	4756.0494	35	4755.8775	20
6.5	5120.6352	-15	5120.7416	4	5122.4940	1	5122.3137	0	6.5	4760.6630	-65	4760.6630	-1	4758.6314	29	4758.4606	2
7.5	5124.6007	8	5124.6796	-26	5122.2001	-15	5122.2001	-15	7.5	4760.8189	-84	4753.6999	-103	4757.6465	-40	4757.4462	-32
8.5	5125.4492	-159	5123.0300	138	5117.2513	99	5117.2513	99	9.5	4753.8189	-84	4753.6999	-103	4753.0574	-19	4752.9191	41

C																	
J	Q1e	O-C	Q1f	O-C	Q2e	O-C	Q2f	O-C	J	Q1e	O-C	Q1f	O-C	Q2e	O-C	Q2f	O-C
.5	4997.9297	21	4997.9864	17	4998.6460	-1	4998.8461	14	1.5	4649.5613	-35	4649.6120	-55	4649.9905	-69	4650.1661	-64
1.5	4991.6047	7	4991.8145	17	4985.4497	-11	4985.8387	26	2.5	4642.9702	-24	4643.1526	-16	4644.8235	-50	4645.1257	-40
3.5	4932.5683	-7	4932.0517	15	4974.2138	0	4974.5284	35	3.5	4633.5697	5	4633.9931	10	4636.3769	-31	4636.7183	-5
4.5	4970.7321	-18	4971.6159	10	4957.4407	7	4957.4407	7	4.5	4621.2714	33	4622.0486	39	4624.7435	-19	4624.7435	-19
5.5	4956.0339	-27	4957.4407	7	4957.4407	7	4957.4407	7	5.5	4587.7284	41	4607.2504	41	4607.2504	41	4607.2504	41
6.5	4938.4297	0	4940.4780	0	4920.6915	-5	4920.6915	-5	7.5	4587.7284	41	4589.3398	36	4568.8715	25	4568.8715	25

TABLE 21
OBSERVED LINE POSITIONS OF 10-8 BAND OF OH

<i>J</i>	R1e	O-C	R1f	O-C	R2e	O-C	R2f	O-C	R1e	O-C	R1f	O-C	R2e	O-C	R2f	O-C	
1.5	4224.5526	-85	4224.4748	-62	4242.6625	-87	4242.5595	-52	2.5	8566.4846	-16	8666.3599	-45	8600.0449	-153	8600.0449	152
2.5	4193.5063	-165	4193.3440	-43	4209.8390	-4	4209.7587	-27	3.5	8626.5985	-43	8626.5136	-9	8549.6073	17	8549.7485	-19
3.5	4159.3875	12	4159.1471	-16	4134.9009	-5	4173.8613	-27	4.5	8513.3306	-23	8582.9533	-7	8495.4581	-48	8495.7131	-42
4.5	4122.2108	46	4121.8635	14	4093.1202	81	4093.2147	46	5.5	8535.4827	18	8534.9684	-22	8482.8462	-15	8437.6076	-40
6.5	4081.9659	67	4081.5013	30	4048.4125	82	4048.5926	32	7.5	8483.5128	24	8427.4909	20	8426.640	-1	8376.0773	32
7.5	4038.6717	75	4038.0830	16	4000.8614	54	4001.1316	9	8.5	8367.4962	-11	8366.5046	-34	8310.8979	28		
8.5	3992.3570	26	3991.6308	7	3950.4765	-43	3950.8334	40	10.5	8335.8642	0						
9.5	3943.0430	-57	3942.1722	-30	3897.2394	-60	3897.7190	-122									
10.5	3890.7394	-72	3889.7292	-114	3841.1458	-33	3841.7240	43									

A

<i>J</i>	P1e	O-C	P1f	O-C	P2e	O-C	P2f	O-C	<i>J</i>	P1e	O-C	P1f	O-C	P2e	O-C	P2f	O-C
1.5	4224.5526	-85	4224.4748	-62	4242.6625	-87	4242.5595	-52	2.5	8566.4846	-16	8666.3599	-45	8600.0449	-153	8600.0449	152
2.5	4193.5063	-165	4193.3440	-43	4209.8390	-4	4209.7587	-27	3.5	8626.5985	-43	8626.5136	-9	8549.6073	17	8549.7485	-19
3.5	4159.3875	12	4159.1471	-16	4134.9009	-5	4173.8613	-27	4.5	8513.3306	-23	8582.9533	-7	8495.4581	-48	8495.7131	-42
4.5	4122.2108	46	4121.8635	14	4093.1202	81	4093.2147	46	5.5	8535.4827	18	8534.9684	-22	8482.8462	-15	8437.6076	-40
6.5	4081.9659	67	4081.5013	30	4048.4125	82	4048.5926	32	7.5	8483.5128	24	8427.4909	20	8426.640	-1	8376.0773	32
7.5	4038.6717	75	4038.0830	16	4000.8614	54	4001.1316	9	8.5	8367.4962	-11	8366.5046	-34	8310.8979	28		
8.5	3992.3570	26	3991.6308	7	3950.4765	-43	3950.8334	40	10.5	8335.8642	0						
9.5	3943.0430	-57	3942.1722	-30	3897.2394	-60	3897.7190	-122									
10.5	3890.7394	-72	3889.7292	-114	3841.1458	-33	3841.7240	43									

B

<i>J</i>	R1e	O-C	R1f	O-C	R2e	O-C	R2f	O-C	<i>J</i>	R1e	O-C	R1f	O-C	R2e	O-C	R2f	O-C
1.5	4337.0281	-62	4337.0654	-45	4339.1812	8	4339.1326	-38	2.5	4351.3851	148	4351.9955	80	4353.8972	14		
2.5	4362.7793	81	4362.8502	-11	4364.9998	73	4364.8856	19	3.5	4371.2300	145	4371.2897	63	4372.2060	57	4372.0399	103
4.5	4371.2300	145	4371.4125	82	4376.5663	146	4376.5716	-69	5.5	4375.4473	3	4375.4473	26				
6.5	4376.5663	-102	4376.5716	108	4378.5716	-69											

C

<i>J</i>	Q1e	O-C	Q1f	O-C	Q2e	O-C	Q2f	O-C
2.5	4277.2337	-204	4277.3907	205				
3.5	4267.3823	364	4267.6469	-524				
4.5	4254.6130	-159	4254.9382	229				

TABLE 23
OBSERVED LINE POSITIONS OF 7-4 BAND OF OH

A									
J	R1e	O-C	R1f	O-C	R2e	O-C	R2f	O-C	
1.5	8311.9055	.22	8311.9736	-.18	8316.5284	.109	8316.5284	-.68	
2.5	8328.3731	-.18	8328.4712	-.23	8333.2784	-.41	8333.2784	-.17	
3.5	8341.1645	.24	8341.2834	-.7	8344.9549	-.26	8344.9549	-.26	
4.5	8350.0921	-.10	8350.1999	.24	8353.6933	-.120	8353.6933	-.120	
5.5	8354.1637	-.3	8355.0551	-.16	8351.6649	.999	8351.6649	.999	
7.5	8351.8124	.999							C
J	Q1e	O-C	Q1f	O-C	Q2e	O-C	Q2f	O-C	
1.5	8248.9943	0	8249.0639	-.22			8250.6681	.87	
2.5	8239.8747	-.1	8240.1283	-.31					
3.5	8226.8280	-.38	8227.3960	9					

TABLE 24
OBSERVED LINE POSITIONS OF 8-5 BAND OF OH

A									
J	P1e	O-C	P1f	O-C	P2e	O-C	P2f	O-C	
1.5	8177.1463	-.6	8177.0314	-.28	8199.0882	.46	1.5	7679.4739	-2
2.5	8138.3044	-.17	8138.5790	-.9	8112.9894	-.76	2.5	7642.2887	-.5
3.5	8096.2954	-.9	8095.9440	-.14	8064.0022	.12	3.5	7612.2887	-.7
4.5	8049.6071	-.10	8049.1138	-.3	8010.9728	-.24	4.5	7600.8023	-.7
5.5	7998.7723	0	7998.1129	1	7954.6220	-.34	5.5	7555.0925	-.15
6.5	7998.7723	0	7998.1129	1	7954.6220	-.34	6.5	7555.1763	-.11
7.5	7943.1515	4	7943.0597	5	7894.1203	-.50	7.5	7504.5560	.13
8.5	7884.9087	8	7883.9436	-.4	7830.6794	-.17	8.5	7451.0574	-.12
9.5	7822.0097	-.10	7820.8678	6	7762.5319	-.17	9.5	7332.9057	-.13
10.5	7755.2105	-.23	7753.8901	-.44	7691.0894	0	10.5	7329.6505	-.3
11.5	7684.5598	.14	7683.0545	-.71	7615.9705	.30	11.5	7264.3798	-.2
12.5	7610.1185	-.30	7608.4098	-.95			12.5	7192.4136	-.162
							13.5	7119.9403	.12
							13.5	7118.2381	-.294
							13.5	7041.8371	-.16
								7046.2361	-.29
								6963.5480	-.71
B									
J	R1e	O-C	R1f	O-C	R2e	O-C	R2f	O-C	
1.5	7808.2115	0	7808.2688	-.5			7791.4586	-.158	
2.5	7823.1131	0	7823.1942	.7			7811.5592	.123	
3.5	7834.2123	2					7826.5465	-.19	
4.5	7841.2345	.999	7841.3742	.803			7836.4508	-.65	
5.5	7844.3633	-.4	7844.4133	.8			7841.3818	.261	
6.5	7843.0540	-.20	7843.0540	-.2			7836.6051	-.13	
7.5	7837.2598	.592	7837.2598	-.74			7836.4517	.148	
8.5	7836.8882	.999					7826.8798	-.71	
9.5	7831.9428	.999							
C									
J	Q1e	O-C	Q1f	O-C	Q2e	O-C	Q2f	O-C	
1.5	7748.4765	.8	7748.5383	-.9			7749.7111	0	
2.5	7759.1491	-.13	7739.3714	.3			7742.2801	-.40	
3.5	7755.8338	-.26	7726.3368	-.14			7709.3006	.23	
4.5	7708.3673	-.6							

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TABLE 25
OBSERVED LINE POSITIONS OF 9–6 BAND OF OH

A								
J	P1e	O-C	P1f	O-C	P2e	O-C	P2f	O-C
1.5					7188.3357	-46	7188.2187	-48
2.5	7167.9943	-51	7167.8970	-60	7150.1058	-11	7150.0190	-27
3.5	7131.6353	-26	7131.4413	-31	7107.4216	158	7107.4216	-134
4.5	7090.9989	8	7090.6866	-6	7060.5016	48	7060.5585	8
5.5	7046.0426	35	7045.5934	23	7009.4153	55	7009.5694	36
6.5	6996.7654	56	6996.1664	40	6954.2349	52	6954.5011	39
7.5	6943.1919	52	6942.4311	43	6894.9904	29	6895.3793	26
8.5	6885.3539	33	6884.4216	26	6831.6944	-16	6832.2163	-11
9.5	6823.2854	-6	6822.1704	0			6765.0104	-25
10.5	6757.0144	-49	6755.7072	-31	6692.9487	-93	6693.7625	-38
11.5	6686.5652	-93	6685.0557	-63	6617.4889	-89	6618.4605	22
12.5	6611.9494	-73	6610.2231	5				

B								
J	R1e	O-C	R1f	O-C	R2e	O-C	R2f	O-C
.5					7273.9141	-121	7273.9141	39
1.5	7290.2905	-17	7290.3363	-15	7292.1507	-8	7292.1041	-13
2.5	7303.4395	24	7303.5039	5	7305.1367	25	7305.0370	6
3.5	7312.6375	46	7312.7016	24	7312.9279	49	7312.7907	28
4.5	7317.6976	38	7317.7385	43	7315.6052	53	7315.4509	23
5.5	7318.4393	46	7318.4393	47	7313.2331	16	7313.0773	22
6.5	7314.7140	18	7314.6563	-12	7305.8410	-15	7305.7090	-32
7.5	7306.3896	-30	7306.2519	-60				
8.5	7293.3453	-34	7293.1172	-134				
9.5			7275.1406	-134				

C								
J	Q1e	O-C	Q1f	O-C	Q2e	O-C	Q2f	O-C
.5					7234.7761	-52	7234.9611	-42
1.5	7233.8999	-44	7233.9535	-55	7227.1627	-38	7227.4795	-13
2.5	7224.2335	-16	7224.4313	-29				
3.5	7210.4510	9	7210.9046	6				
4.5	7192.4221	8	7193.2490	29				
5.5	7170.0422	29	7171.3649	11				

uals of the stronger lines—these turned out to be lines near the head of an *R* branch.

Each branch was fit to a polynomial in *J* using the interactive computer code ANALYSIS developed by Peceny & Davis (1988). Line-by-line fitting was critical for correctly assigning the lambda-doubling components and extending the branches beyond previously measured transitions. Lines which deviated by more than three standard deviations (3σ) were assumed to be misidentified and purged from the fitting process so that the polynomial estimates could be refined for successive calculations.

Once identified, the observed line positions were fitted to calculated line positions derived from Hamiltonian matrices. The matrix elements of the effective Hamiltonian were calculated using the unique perturber approximation for a $^2\Pi$ state perturbed by a $^2\Sigma$ state and Hund's case (*a*) parity symmetrized basis set. The matrix elements, given in Table 2, are identical to those used by Abrams et al. (1990) in an earlier analysis of highly excited rotational states of OH. A nonlinear least-squares method was used in a global fit of all identified lines to derive equilibrium molecular parameters. Trial parameters were developed and used to set up the Hamiltonians of the upper and lower vibrational states with *v* between 0 and 10. The matrices were diagonalized to obtain the energy sublevels for each *J*-value of the upper and lower states, from which calculated line positions were obtained.

Iterative comparison of the experimental line positions with the calculated line positions permitted the evaluation of corrections to the molecular parameters with which a new set of term values is calculated. Two iterations were sufficient for the fit to converge, once erroneous assignments were eliminated.

4. RESULTS

The 1696 observed line positions of the $\Delta v = 1, 2$, and 3 sequences were used to derive 104 molecular parameters with a standard deviation of 0.003 cm^{-1} . The observed line positions and residuals (calculated minus observed) are given in Tables 3–25; the lines are labeled with the traditional F_1 or F_2 , *e* or *f* notation. The derived molecular parameters are given in Tables 26A and 26B. The molecular parameters display a slow variation with vibrational quantum number; in particular the spin-orbit parameter *A* decreases smoothly until *v* = 7 when it begins increasing. In contrast A_D is negative and varies slowly until *v* = 6 when it changes by a factor of 2 in magnitude. Previous measurements by Coxon & Foster (1982) have reached a similar conclusion about the variation in *A* based on merges of independent fits of each band, but they were unable to determine A_D for *v* > 4 and consequently the discontinuity in A_D is unexpected.

Rotational term values are given in Table 27 for all energy levels with $0 \leq v \leq 10$. The term values are calculated using the

TABLE 26A
MOLECULAR PARAMETERS FOR THE $X^2\Pi_i$ STATE OF OH: $v = 0-4$

v	0	1	2	3	4
T_e	0.0	3569.64083 (8)	6973.67894 (8)	10214.0374 (9)	13291.8114 (1)
A	-139.115111 (35)	-139.38463 (34)	-139.65156 (35)	-139.90749 (34)	-140.14688 (34)
B	18.550208 (19)	17.8384461 (89)	17.136263 (17)	16.441072 (17)	15.7493454 (17)
$D \times 10^2$	0.19120892 (17)	0.18733 (15)	0.18394 (15)	0.18129 (16)	0.17906 (14)
$H \times 10^6$	0.123 (85)	0.116 (71)	0.112 (74)	0.116 (77)	[0.1160]
$A_D \times 10^3$	-0.746 (27)	-0.710 (27)	-0.665 (27)	-0.623 (26)	-0.50 (26)
P	0.235001 (55)	0.224377 (51)	0.213382 (49)	0.203733 (49)	0.191900 (51)
$P_D \times 10^4$	-0.187 (49)	-0.177 (48)	-0.157 (50)	-0.274 (53)	-0.275 (57)
q	-0.038689 (16)	-0.036957 (15)	-0.035169 (15)	-0.0337132 (15)	-0.0317617 (16)
$q_D \times 10^4$	0.139 (12)	0.137 (11)	0.133 (12)	0.178 (13)	0.165 (15)
$q_H \times 10^9$	[-0.1801]	[-0.1732]	[-0.1751]	[-0.17]	[-0.17]
$L' \times 10^{12}$	[-0.2298]	[-0.2790]	[-0.3301]	[-0.33]	[-0.33]
$A_H \times 10^5$	[0.1852]	[0.2001]	[0.2094]	[0.208]	[0.208]

^a All values are given in reciprocal centimeters, and the error quoted is one standard deviation in the last decimal place. The standard deviation is 0.0035 cm⁻¹ for reproducing individual spectral lines. Bracketed quantities are held constant during the fitting process.

TABLE 27
ROTATIONAL TERM VALUES

J	F1e	F2e	F1f	F2f	J	F1e	F2e	F1f	F2f
$v = 0$									
0.5	0.0000	88.1066	0.0000	88.2642	6.5	7644.0167	7937.7060	7645.5684	7937.1593
1.5	-38.2480	149.3063	-38.1926	149.5662	7.5	7883.7265	8205.3588	7885.8209	8204.4142
2.5	45.4751	250.5844	45.6759	250.8567	8.5	8155.9084	8506.2277	8158.6138	8504.8175
3.5	163.6828	391.0906	164.1301	391.2743	9.5	8460.3387	8839.8061	8463.7187	8837.8672
4.5	316.8713	570.0096	317.6645	570.0057	10.5	8796.7208	9205.5799	8800.8347	9203.0535
5.5	505.3461	786.6275	506.5779	786.3434	11.5	9164.6954	9603.0187	9169.5983	9599.8503
6.5	729.2320	1040.3214	730.9884	1039.6715	12.5	9563.8483	10031.5703	9569.5913	10027.7096
7.5	988.5057	1330.5286	990.8664	1329.4335	13.5	9993.7162	10490.6581	10000.3461	10486.0588
8.5	1283.0269	1656.7166	1286.0664	1655.1022	14.5	10453.7910	10979.6785	10461.3506	10974.2986
9.5	1612.5619	2018.3606	1616.3497	2016.1578	15.5	10943.5238	11498.0011	10952.0516	11491.8029
10.5	1976.8000	2414.9290	1981.4015	2412.0731	16.5	11462.3280	12044.9691	11471.8582	12037.9193
11.5	2375.3659	2845.8735	2380.8419	2842.3039	17.5	12009.5827	12619.8999	12020.1447	12611.9696
12.5	2807.8271	3310.6226	2814.2344	3306.2833	18.5	12584.6351	13222.0871	12596.2540	13213.2522
13.5	3273.7003	3808.5790	3281.0913	3803.4180	19.5	13186.8041	13850.8029	13199.5002	13841.0437
$v = 1$									
0.5	0.0000	3657.1704	0.0000	3657.3209	$v = 3$				
1.5	3530.2232	3715.8559	3530.2744	3716.1057	0.5	0.0000	10300.4310	0.0000	10300.5673
2.5	3610.9558	3813.0239	3611.1421	3813.2892	1.5	10172.2962	10354.2101	10172.3396	10354.4393
3.5	3724.8597	3947.8979	3725.2768	3948.0832	2.5	10247.1238	10443.3400	10247.2832	10443.5898
4.5	3872.3839	4119.7165	3873.1267	4119.7272	3.5	10352.5507	10567.1784	10352.9109	10567.3639
5.5	4053.8085	4327.7993	4054.9659	4327.5467	4.5	10488.9346	10725.0566	10489.5810	10725.1017
6.5	4269.2473	4571.5442	4270.9020	4570.9460	5.5	10656.5025	10916.3875	10657.5159	10916.1935
7.5	4518.6752	4850.4023	4520.9037	4849.3823	6.5	10855.3436	11140.5832	10856.7987	11140.0846
8.5	4801.9545	5163.8515	4804.8282	5162.3388	7.5	11085.4247	11397.1307	11087.3906	11396.2584
9.5	5118.8571	5511.3764	5122.4426	5509.3049	8.5	11346.6104	11685.5257	11349.1508	11684.2179
10.5	5469.0801	5892.4545	5473.4395	5889.7625	9.5	11638.6805	12005.2751	11641.8547	12003.4690
11.5	5852.2564	6306.5468	5857.4477	6303.1768	10.5	11961.3430	12355.8672	11965.2064	12353.5089
12.5	6267.9633	6753.0919	6274.0402	6748.9909	11.5	12314.2447	12736.7813	12318.8491	12733.8185
13.5	6715.7280	7231.5032	6722.7401	7226.6223	12.5	12696.9777	13147.4737	12702.3724	13143.8566
14.5	7195.0321	7741.1666	7203.0246	7735.4610	13.5	13109.0853	13587.3768	13115.3175	13583.0575
15.5	7705.3158	8281.4400	7714.3294	8274.8698	14.5	13550.0665	14055.8973	13557.1819	14050.8290
16.5	8245.9804	8851.6540	8256.0514	8844.1834	15.5	14019.3792	14552.4160	14027.4229	14546.5518
17.5	8816.3920	9451.1123	8827.5520	9442.7105	16.5	14516.4436	15076.2879	14525.4612	15069.5803
18.5	9415.8841	10079.0939	9428.1599	10069.7347	17.5	15040.6451	15626.8437	15050.6838	15619.2431
19.5	10043.7605	10734.8544	10057.1740	10724.5165	18.5	15591.3370	16203.3916	15602.4470	16194.8447
$v = 2$									
0.5	0.0000	7060.6398	0.0000	7060.7829	$v = 4$				
1.5	6933.0972	7116.8549	6933.1442	7117.0940	0.5	13377.6330	0.0000	13377.7613	
2.5	7010.8689	7209.9785	7011.0409	7210.2359	1.5	13248.9147	13428.9995	13248.9540	13429.2170
3.5	7120.5188	7339.3033	7120.9058	7339.4891	2.5	13320.8025	13514.1682	13320.9478	13514.4082
4.5	7262.4496	7504.1199	7263.1417	7504.1443	3.5	13422.0197	13632.5570	13422.3497	13632.7409
5.5	7436.9148	7703.7812	7437.9972	7703.5594	4.5	13552.8794	13783.5546	13553.4742	13783.6022
$v = 3$									
0.5	0.0000	7060.6398	0.0000	7060.7829	5.5	13713.5807	13966.5790	13714.5168	13966.4141
1.5	6933.0972	7116.8549	6933.1442	7117.0940	6.5	13904.1981	14181.0900	13905.5467	14180.6413
2.5	7010.8689	7209.9785	7011.0409	7210.2359	7.5	14124.6921	14426.5783	14126.5189	14425.7802
3.5	7120.5188	7339.3033	7120.9058	7339.4891	8.5	14374.9260	14702.5507	14377.2919	14701.3422
4.5	7262.4496	7504.1199	7263.1417	7504.1443	9.5	14654.6810	15008.5158	14657.6428	15006.8399
5.5	7436.9148	7703.7812	7437.9972	7703.5594	10.5	14963.6688	15343.9734	14967.2794	15341.7768
$v = 1$									
0.5	0.0000	88.1066	0.0000	88.2642	11.5	15301.5404	15708.4070	15305.8500	15705.6391
1.5	-38.2480	149.3063	-38.1926	149.5662	12.5	15667.8936	16101.2794	15672.9497	16097.8917
2.5	45.4751	250.5844	45.6759	250.8567	13.5	16062.2776	16522.0293	16068.1260	16517.9751

TABLE 26B
MOLECULAR PARAMETERS FOR THE $X^2\Pi_i$ STATE OF OH: $v = 5-10$

v	5	6	7	8	9	10
T_e	16207.1055 (1)	18958.7998 (1)	21544.2746 (1)	23959.0059 (1)	26196.0397 (1)	28245.3134 (1)
A	-140.35308 (34)	-140.50665 (34)	-140.57257 (34)	-140.49428 (34)	-140.20552 (34)	-139.56879 (34)
B	15.056964 (17)	14.359072 (18)	13.648691 (18)	12.917041 (19)	12.152874 (20)	11.338859 (26)
$D \times 10^2$	0.17730 (13)	0.17686 (16)	0.17781 (15)	0.18062 (17)	0.18771 (18)	0.19842 (25)
$H \times 10^6$	[0.09556]	[0.07861]	[0.05878]	[0.01484]	[0.03317]	[0.01]
$A_D \times 10^3$	-0.512 (26)	-0.236 (25)	-0.112 (24)	-0.079 (23)	0.124 (23)	0.353 (23)
P	0.179240 (52)	0.167682 (53)	0.153709 (55)	0.137667 (60)	0.116907 (62)	0.092975 (81)
$P_D \times 10^4$	-0.215 (57)	-0.492 (59)	-0.539 (62)	-0.646 (69)	-0.560 (71)	-0.696 (98)
q	-0.0298844 (17)	-0.27983 (18)	-0.25933 918)	-0.23866 (20)	-0.021318 (21)	-0.18656 (29)
$q_D \times 10^4$	0.163 (15)	0.168 (17)	0.167 (16)	0.182 (19)	0.167 (20)	0.171 (28)
$q_H \times 10^9$	[-0.17]	[-0.17]	[-0.17]	[-0.17]	[-0.17]	[-0.17]
$L' \times 10^{12}$	[-0.33]	[-0.33]	[-0.33]	[-0.33]	[-0.33]	[-0.33]
$A_H \times 10^5$	[0.206]	[0.205]	[0.204]	[0.203]	[0.202]	[0.201]

^a All values are given in reciprocal centimeters, and the error quoted is one standard deviation in the last decimal place. The standard deviation is 0.0035 cm⁻¹ for reproducing individual spectral lines. Bracketed quantities are held constant during the fitting process.

TABLE 27—Continued

J	F1e	F2e	F1f	F2f	J	F1e	F2e	F1f	F2f
v = 5									
14.5	16484.1978	16970.0705	16490.8834	16965.3035	0.5	0.0000	21628.2079	0.0000	21628.3097
15.5	16933.1192	17444.7911	16940.6867	17439.2647	1.5	21497.9482	21672.3187	21497.9763	21672.4941
16.5	17408.4693	17945.5541	17416.9643	17939.2204	2.5	21560.8224	21745.5385	21560.9278	21745.7381
17.5	17909.6413	18471.6985	17919.1115	18464.5070	3.5	21649.1743	21847.4418	21649.4172	21847.6050
18.5	18435.9968	19022.5412	18446.4936	19014.4373	4.5	21763.1878	21977.5477	21763.6315	21977.6106
19.5	18986.8689	19597.3788	18998.4484	19588.3023	5.5	21902.9729	22135.3655	21903.6790	22135.2658
					6.5	22068.5484	22320.4112	22069.5746	22320.0903
v = 6									
0.5	0.0000	16292.3377	0.0000	16292.4572	7.5	22259.8425	22532.2082	22261.2422	22531.6117
1.5	16163.0575	16341.3010	16163.0930	16341.5045	8.5	22476.7003	22770.2802	22478.5220	22769.3581
2.5	16231.9895	16422.5177	16232.1212	16422.7447	9.5	22718.8922	23034.1432	22721.1806	23032.8493
3.5	16328.9808	16535.4623	16329.2815	16535.6401	10.5	22986.1228	23323.2981	22988.9188	23321.5895
4.5	16454.3011	16679.5696	16454.8457	16679.6236	11.5	23278.0372	23637.2248	23281.3786	23635.0615
5.5	16608.1213	16854.2895	16608.9816	16854.1480	12.5	23594.2264	23975.3786	23598.1485	23972.7227
6.5	16790.4994	17059.1016	16791.7429	17058.6977	13.5	23934.2317	24337.1872	23938.7677	24334.0024
7.5	17001.3881	17293.5089	17003.0766	17292.7806	14.5	24297.5476	24722.0493	24302.7296	24718.2998
8.5	17240.6470	17557.0258	17242.8382	17555.9158	15.5	24683.6251	25129.3338	24689.4849	25124.9838
9.5	17508.0569	17849.1654	17510.8041	17847.6205	16.5	25091.8738	25558.3799	25098.4439	25553.3920
10.5	17803.3299	18169.4307	17806.6830	18167.4010	17.5	25521.6643	26008.4973	25528.9790	26002.8317
11.5	18126.1185	18517.3072	18130.1244	18514.7456	18.5	25972.3302	26478.9678	25980.4273	26472.5807
12.5	18476.0214	18892.2585	18480.7245	18889.1202	19.5	26443.1706	26969.0462	26452.0926	26961.8880
v = 7									
0.5	0.0000	16292.3377	0.0000	16292.4572	7.5	22259.8425	22532.2082	22261.2422	22531.6117
1.5	16163.0575	16341.3010	16163.0930	16341.5045	8.5	22476.7003	22770.2802	22478.5220	22769.3581
2.5	16231.9895	16422.5177	16232.1212	16422.7447	9.5	22718.8922	23034.1432	22721.1806	23032.8493
3.5	16328.9808	16535.4623	16329.2815	16535.6401	10.5	22986.1228	23323.2981	22988.9188	23321.5895
4.5	16454.3011	16679.5696	16454.8457	16679.6236	11.5	23278.0372	23637.2248	23281.3786	23635.0615
5.5	16608.1213	16854.2895	16608.9816	16854.1480	12.5	23594.2264	23975.3786	23598.1485	23972.7227
6.5	16790.4994	17059.1016	16791.7429	17058.6977	13.5	23934.2317	24337.1872	23938.7677	24334.0024
7.5	17001.3881	17293.5089	17003.0766	17292.7806	14.5	24297.5476	24722.0493	24302.7296	24718.2998
8.5	17240.6470	17557.0258	17242.8382	17555.9158	15.5	24683.6251	25129.3338	24689.4849	25124.9838
9.5	17508.0569	17849.1654	17510.8041	17847.6205	16.5	25091.8738	25558.3799	25098.4439	25553.3920
10.5	17803.3299	18169.4307	17806.6830	18167.4010	17.5	25521.6643	26008.4973	25528.9790	26002.8317
11.5	18126.1185	18517.3072	18130.1244	18514.7456	18.5	25972.3302	26478.9678	25980.4273	26472.5807
12.5	18476.0214	18892.2585	18480.7245	18889.1202	19.5	26443.1706	26969.0462	26452.0926	26961.8880
v = 8									
0.5	0.0000	20415.1940	20145.0448	20645.3154	0.5	0.0000	24042.1684	0.0000	24042.2583
1.5	20615.0108	21152.5754	20623.8381	21145.8987	1.5	23911.5704	24083.7805	23911.5949	24083.9357
2.5	21116.6992	21677.2725	21126.4868	21669.7464	2.5	23971.2692	24152.8724	23971.3614	24153.0492
3.5	21641.5208	22224.5732	21652.3225	22216.1404	3.5	24055.1031	24249.0615	24055.3167	24249.2059
v = 6									
0.5	0.0000	19043.4107	0.0000	19043.5224	4.5	24295.6772	24520.9381	24296.3028	24520.8458
1.5	18913.6068	19089.9622	18913.6386	19090.1536	5.5	24452.4887	24695.6924	24453.4003	24695.4002
2.5	18979.5451	19167.2078	18979.6637	19167.4238	7.5	24633.5587	24895.6973	24634.8039	24895.1561
3.5	19072.2633	19274.6740	19072.5355	19274.8476	8.5	24838.7181	25120.4762	24840.3401	25119.6412
4.5	19191.9883	19411.8392	19192.4833	19411.9008	9.5	25067.7254	25369.5396	25069.7630	25368.3699
5.5	19338.8612	19578.1838	19339.6459	19578.0658	10.5	25320.2730	25642.3788	25322.7610	25640.8373
6.5	19512.9220	19773.2062	19514.0588	19772.8455	11.5	25595.9932	25938.4608	25598.9629	25936.5135
7.5	19714.1124	19996.4204	19715.6590	19995.7586	12.5	26215.2046	26598.0769	26219.2201	26595.2254
8.5	19942.2867	20247.3466	19944.2959	20246.3295	13.5	26557.6947	26960.3935	26562.2701	26957.0469
9.5	20197.2221	20525.5006	20199.7426	20524.0784	14.5	26921.3603	27343.5153	26926.5189	27339.6454
10.5	20478.6292	20830.3860	20481.7059	20828.5121	15.5	27305.5838	27746.7487	27311.3488	27742.3268
11.5	20786.1586	21161.4876	20789.8333	21159.1183	17.5	27709.7041	28169.3662	27716.1001	28164.3616
12.5	21119.4077	21518.2669	21123.7194	21515.3608	18.5	28133.0184	28610.6065	28140.0724	28604.9851
13.5	21477.9246	21900.1598	21482.9105	21896.6770	19.5	28574.7836	29069.6753	28582.5269	29063.3980
v = 9									
0.5	0.0000	22306.5748	21866.9083	22302.4761	0.5	0.0000	26278.2933	0.0000	26278.3676
1.5	22668.7308	22736.8923	22275.1731	22732.1383	1.5	26147.5341	26317.3126	26147.5547	26317.4404
2.5	22699.9017	23190.4652	22707.1263	23185.0152	2.5	26203.8957	26382.1120	26203.9735	26382.2564
3.5	23154.1087	23666.6190	23162.1540	23660.4298	3.5	26282.9875	26472.3466	26283.1686	26472.4610
4.5	23630.7009	24164.6535	23639.6083	24157.6780	4.5	26384.9063	26587.6060	26385.2405	26587.6403
5.5	24128.9952	24683.8445	24138.8112	24676.0298	5.5	26509.6913	26727.4483	26510.2276	26727.3525

TABLE 27—Continued

J	F1e	F2e	F1f	F2f
6.5	26657.3074	26891.4163	26658.0922	26891.1431
7.5	26827.6411	27079.0425	26828.7171	27078.5480
8.5	27020.5034	27289.8463	27021.9094	27289.0902
9.5	27235.6345	27523.3299	27237.4057	27522.2755
10.5	27472.7099	27778.9727	27474.8776	27777.5864
11.5	27731.3447	28056.2277	27733.9375	28054.4786
12.5	28011.0981	28354.5179	28014.1419	28352.3773
13.5	28311.4766	28673.2343	28314.9956	28670.6749
14.5	28631.9371	29011.7342	28635.9539	29008.7293
15.5	28971.8886	29369.3404	28976.4258	29365.8632
16.5	29330.6949	29745.3415	29335.7758	29741.3638
17.5	29707.6762	30138.9915	29713.3257	30134.4827
18.5	30102.1111	30549.5112	30108.3574	30544.4367
19.5	30513.2379	30976.0890	30520.1142	30970.4085
v = 10				
0.5	0.0000	28326.4343	0.0000	28326.4900
1.5	28195.8131	28362.7110	28195.8298	28362.8054
2.5	28248.5924	28422.9623	28248.6559	28423.0649
3.5	28322.6016	28506.8754	28322.7500	28506.9473
4.5	28417.8913	28614.0678	28418.1664	28614.0665
5.5	28534.4595	28744.1151	28534.9027	28743.9980
6.5	28672.2354	28896.5669	28672.8860	28896.2933
7.5	28831.0743	29070.9517	28831.9682	29070.4841
8.5	29010.7586	29266.7772	29011.9279	29266.0812
9.5	29211.0002	29483.5264	29212.4737	29482.5710
10.5	29431.4458	29720.6543	29433.2486	29719.4116
11.5	29671.6798	29977.5842	29673.8338	29976.0289
12.5	29931.2281	30253.7049	29933.7528	30251.8139
13.5	30209.5610	30548.3686	30212.4737	30546.1204
14.5	30506.0955	30860.8896	30509.4121	30858.2633
15.5	30820.1970	31190.5429	30823.9329	31187.5177
16.5	31151.1815	31536.5647	31155.3526	31533.1186
17.5	31498.3167	31898.1519	31502.9405	31894.2603
18.5	31860.8240	32274.4626	31865.9210	32270.0974
19.5	32237.8798	32664.6173	32243.4748	32659.7450

TABLE 28
SUMMARY OF PREDICTED INFRARED
AND VISIBLE TRANSITIONS

	Δv	$v' - v''$
3		3-0
4		4-0
		5-1
		6-2
		7-3
		8-4
		9-5
		10-6
5		5-0
		6-1
		7-2
		8-3
		9-4
		10-5
6		6-0
		7-1
		8-2
		9-3
		10-4

TABLE 29
PREDICTED LINE POSITIONS FOR INFRARED AND VISIBLE TRANSITIONS

Wavenumber (cm ⁻¹)	Wavelength (Angstroms)	Identification	Wavenumber (cm ⁻¹)	Wavelength (Angstroms)	Identification
9095.03618	10991.99802	10-6 P2e(4.5)	9874.91487	10123.89452	9-5 P1e(3.5)
9095.04653	10949.98551	10-6 P2f(4.5)	9894.99574	10103.65539	9-5 P2f(2.5)
9130.26671	10949.58360	10-6 P1f(4.5)	9894.79492	10103.58412	9-5 P2e(2.5)
9130.51321	10949.16807	10-6 P1e(4.5)	9907.58239	10090.10630	9-5 Q2e(4.5)
9148.21727	10928.09836	10-6 P2f(3.5)	9908.07075	10090.01632	9-5 Q2f(4.5)
9148.28834	10928.03476	10-6 P2e(4.5)	9915.43349	10082.52392	9-5 P1f(2.5)
9176.12032	10894.86775	10-6 P1f(3.5)	9915.54463	10082.41091	9-5 P1e(2.5)
9176.32904	10894.61994	10-6 P1e(3.5)	9930.06666	10067.67212	9-5 Q1e(4.5)
9195.38159	10872.04656	10-6 P2f(2.5)	9930.93936	10066.71322	9-5 Q1f(4.5)
9195.50329	10871.90267	10-6 P2e(4.5)	9936.70640	10060.93877	9-5 Q2e(3.5)
9202.16700	10864.02881	10-6 Q2e(4.5)	9936.86310	10060.78011	9-5 P2f(1.5)
9202.22730	10863.95862	10-6 Q2f(4.5)	9936.99238	10060.64922	9-5 P2e(1.5)
9216.16603	10847.526769	10-6 P1f(2.5)	9936.99873	10067.62779	9-5 Q2f(3.5)
9225.26800	10847.40767	10-6 P1e(2.5)	9953.70600	10043.75598	9-5 Q1e(3.5)
9225.40800	10836.66066	10-6 Q1e(4.5)	9954.48783	10043.26581	9-5 Q1f(3.5)
9226.17810	10835.756613	10-6 Q1f(4.5)	9959.36730	10038.04669	9-5 Q2e(2.5)
9232.02778	10828.89026	10-6 Q2e(4.5)	9959.73868	10037.67239	9-5 Q2f(2.5)
9232.27336	10828.60221	10-6 Q2f(3.5)	9971.77446	10025.55703	9-5 Q1e(2.5)
9236.33631	10823.83883	10-6 P2f(1.5)	9971.98399	10025.34638	9-5 Q1f(2.5)
9236.47214	10823.67966	10-6 P2e(1.5)	9975.80811	10021.50326	9-5 Q2e(1.5)
9250.06601	10807.73117	10-6 Q1e(2.5)	9976.13943	10021.17043	9-5 Q2f(1.5)
9250.48669	10807.28167	10-6 Q1f(3.5)	9984.44110	10012.83819	9-5 Q1e(1.5)
9255.53851	10801.38286	10-6 Q2e(2.5)	9984.49718	10012.78195	9-5 Q1f(1.5)
9255.85713	10801.01104	10-6 Q2f(2.5)	9985.83611	10011.43941	9-5 Q2e(0.5)
9268.92865	10785.77886	10-6 Q1e(2.5)	9986.02984	10011.24518	9-5 Q2f(0.5)
9269.11081	10785.56689	10-6 Q1f(2.5)	9997.16878	10000.09052	3-0 P2e(4.5)
9272.55740	10781.55791	10-6 Q2e(1.5)	9997.35817	9999.90108	3-0 P2f(4.5)
9272.84321	10781.22560	10-6 Q2f(1.5)	10024.97486	9972.33338	9-5 R2e(0.5)
9282.17446	10770.38774	10-6 Q1e(1.5)	10024.98317	9972.34511	9-5 R2f(0.5)
9282.22302	10770.33099	10-6 Q1f(1.5)	10035.24647	9962.14611	3-0 P1f(4.5)
9282.91195	10769.53167	10-6 Q2e(0.5)	10035.67939	9961.71636	3-0 P1e(4.5)
9283.07929	10769.33754	10-6 Q2f(0.5)	10040.75187	9956.68379	9-5 R2f(1.5)
9319.28302	10727.50000	10-6 R2f(0.5)	10040.81100	9956.62516	9-5 R2e(1.5)
9319.30038	10727.48051	10-6 R2e(0.5)	10040.83815	9956.59224	9-5 R1e(1.5)
9332.91124	10711.83581	10-6 R2f(1.5)	10040.88046	9956.55628	9-5 R1f(1.5)
9333.00013	10711.73317	10-6 R2e(1.5)	10049.71636	9947.80226	9-5 R2f(0.5)
9334.98564	10709.45544	10-6 R1e(1.5)	10049.82887	9947.69089	9-5 R2e(1.5)
9335.17127	10709.41915	10-6 R1f(1.5)	10050.59800	9946.53378	9-5 R1e(0.5)
9339.21889	10704.60108	10-6 R2f(3.5)	10055.04743	9946.48486	9-5 R1f(2.5)
9339.39383	10704.40057	10-6 R2e(3.5)	10052.00019	9945.54210	9-5 R2f(2.5)
9339.52352	10704.25193	10-6 R2f(2.5)	10052.14375	9945.40006	9-5 R2e(3.5)
9339.66765	10704.08674	10-6 R2e(2.5)	10052.24948	9945.29545	3-0 P2a(3.5)
9343.05650	10700.20421	10-6 R1e(2.5)	10052.31546	9945.23018	3-0 P2f(3.5)
9343.08629	10700.17010	10-6 R1f(2.5)	10055.92552	9941.65984	9-5 R1e(2.5)
9345.62797	10697.26002	10-6 R1e(3.5)	10126.66366	9872.21380	3-0 P1f(2.5)
9345.63091	10697.25665	10-6 R1f(3.5)	10083.15306	9914.81429	3-0 P1f(3.5)
9792.77697	10208.80996	9-5 P2e(4.5)	10083.44098	9914.51119	3-0 P1e(3.5)
9792.83737	10208.74700	9-5 P2f(4.5)	10103.58259	9894.76639	3-0 P2f(2.5)
9828.82298	10171.88774	9-5 P1f(4.5)	10103.62256	9894.72426	3-0 P2e(2.5)
9828.86868	10171.51165	9-5 P1e(4.5)	10126.66366	9941.62677	9-5 R1f(3.5)
9846.61621	10152.99016	9-5 P2f(3.5)	10126.82107	9872.06035	3-0 P1e(2.5)
9846.64967	10152.95565	9-5 P2e(3.5)	10151.00116	9848.54463	3-0 P2f(1.5)
9874.69199	10124.12303	9-5 P1f(3.5)	10151.12470	9848.42477	3-0 P2e(1.5)
			10155.05991	9844.60837	3-0 Q2e(4.5)
			10155.09207	9844.57720	3-0 Q1e(4.5)
			10171.27014	9828.91870	3-0 Q1e(4.5)

TABLE 29—Continued

Wavenumber (cm ⁻¹)	Wavelength (Angstroms)	Identification	Wavenumber (cm ⁻¹)	Wavelength (Angstroms)	Identification
10172.70969	9827.52780	3-0 Q1f(4.5)	10654.93615	9382.74713	8-4 Q2f(1.5)
10175.90410	9824.44274	3-0 Q2e(3.5)	10662.61641	9375.98873	8-4 Q1e(1.5)
10176.27332	9824.08628	3-0 Q2f(3.5)	10662.68027	9375.93258	8-4 Q1f(1.5)
1018-4.2058	9812.37337	3-0 Q1e(3.5)	10664.07071	9374.41445	8-4 Q2e(0.5)
10189.22814	9811.59567	3-0 Q1f(3.5)	10664.62530	9374.22257	8-4 Q2f(0.5)
10192.48330	9808.46215	3-0 Q2e(2.5)	10706.14755	9337.86587	8-4 R2e(0.5)
10193.00531	9807.95983	3-0 Q2f(2.5)	10706.17430	9337.84254	8-4 R2f(0.5)
10201.44784	9799.84292	3-0 Q1e(2.5)	10722.35453	9323.75151	8-4 R1e(1.5)
10201.80007	9799.49688	3-0 Q1f(2.5)	10722.40742	9323.70552	8-4 R1f(1.5)
10204.64387	9796.77366	3-0 Q2e(1.5)	10723.83223	9322.46674	8-4 R2f(1.5)
10205.13301	9796.30409	3-0 Q2f(1.5)	10723.87286	9322.43141	8-4 R2e(1.5)
10210.48877	9791.16557	3-0 Q1e(1.5)	10734.30057	9313.37522	8-4 R1e(2.5)
10210.58762	9791.07078	3-0 Q1f(1.5)	10734.36886	9313.31597	8-4 R1f(2.5)
10212.16680	9789.55671	3-0 Q2e(0.5)	10734.79769	9312.94392	8-4 R2f(2.5)
10212.46074	9789.27494	3-0 Q2f(0.5)	10734.89331	9312.86096	8-4 R2e(2.5)
10266.10345	9738.12360	3-0 R2e(0.5)	10739.21837	9309.11034	8-4 R2f(3.5)
10266.17511	9738.05562	3-0 R2f(0.5)	10739.34793	9308.9803	8-4 R2e(3.5)
10285.37180	9719.88039	3-0 R1e(1.5)	10741.19383	9307.39825	8-4 R1e(3.5)
10285.47576	9719.8215	3-0 R1f(1.5)	10741.25568	9307.34466	8-4 R1f(3.5)
10294.02357	9711.71114	3-0 R2f(1.5)	11122.37613	8988.41708	7-3 P2e(4.5)
10294.03372	9711.70156	3-0 R2e(1.5)	11122.50326	8988.31434	7-3 P2f(4.5)
10307.07558	9699.41301	3-0 R1e(2.5)	11159.833618	8958.24568	7-3 P1f(4.5)
10307.23501	9699.26298	3-0 R1f(2.5)	11160.23973	8957.92176	7-3 P1e(4.5)
10316.50714	9690.54558	3-0 R2f(2.5)	11178.36010	8943.40071	7-3 P2e(3.5)
10316.59395	9690.46404	3-0 R2e(2.5)	11178.37422	8943.38941	7-3 P2f(3.5)
10325.25181	9682.33843	3-0 R1e(3.5)	11208.01688	8919.72608	7-3 P1f(3.5)
10325.45088	9682.15176	3-0 R1f(3.5)	11208.27174	8919.53326	7-3 P1e(3.5)
10333.3.82239	9674.30346	3-0 R2f(3.5)	11228.90431	8903.14398	7-3 P2f(2.5)
10333.97506	9674.16522	3-0 R2e(3.5)	11228.97862	8903.08507	7-3 P2e(2.5)
10465.50696	9552.57860	8-4 P2e(4.5)	11250.69312	8885.90152	7-3 P1f(2.5)
10465.60368	9552.49032	8-4 P2f(4.5)	11250.82441	8885.79783	7-3 P1e(2.5)
10501.84253	9519.52730	8-4 P1f(4.5)	11252.44605	8884.51725	7-3 Q2e(4.5)
10502.22377	9519.18173	8-4 P1e(4.5)	11252.54502	8884.43911	7-3 Q2f(4.5)
10520.30826	9502.81812	8-4 P2f(3.5)	11273.60684	8867.8076	7-3 Q1e(4.5)
10520.31531	9502.81176	8-4 P2e(3.5)	11273.87044	8867.63345	7-3 P2f(1.5)
10549.0.1173	9476.96122	8-4 P1f(3.5)	11273.39786	8867.53320	7-3 P2e(1.5)
10549.26943	9476.74768	8-4 P1e(3.5)	11274.69690	8866.98340	7-3 Q1f(4.5)
10569.52743	9458.56615	8-4 P2f(2.5)	11280.07776	8862.75355	7-3 Q2e(3.5)
10609.61229	9458.49021	8-4 P2e(2.5)	11280.42656	8862.07958	7-3 Q2f(3.5)
10588.30274	9441.79405	8-4 Q2e(4.5)	11313.80405	8850.05474	7-3 Q1e(3.5)
10613.04132	9441.70311	8-4 Q2f(4.5)	11296.86648	8849.58228	7-3 Q1f(3.5)
10613.16886	9419.67232	8-4 P2e(1.5)	11313.87933	8845.60279	7-3 Q2e(2.5)
10616.32062	9416.87581	8-4 P1f(2.5)	11301.94874	8827.12374	7-3 Q1e(1.5)
10616.64887	9416.59635	8-4 P1e(3.5)	11325.60859	8827.17051	7-3 Q2f(0.5)
10650.32136	9386.81269	8-4 Q1e(2.5)	11388.52262	8778.35673	7-3 R1e(1.5)
10650.55887	9386.60336	8-4 Q1f(2.5)	11388.58823	8778.30897	7-3 R1f(1.5)
10654.56356	9383.07524	8-4 Q2e(1.5)	11391.29878	8776.22017	7-3 R2f(1.5)

TABLE 29—Continued

Wavenumber (cm ⁻¹)	Wavelength (Angstroms)	Identification	Wavenumber (cm ⁻¹)	Wavelength (Angstroms)	Identification
11391.32845	8776.19731	7-3 R2e(1.5)	11980.54141	8344.57484	6-2 Q1f(1.5)
11402.05057	8767.94442	7-3 R1e(2.5)	11982.62780	8343.12190	6-2 Q2e(0.5)
11402.13399	8767.88028	7-3 R1f(2.5)	11982.94552	8342.94552	6-2 Q2f(0.5)
11404.01520	8766.3392	7-3 R2f(2.5)	11984.98547	8341.48664	10-5 P2f(1.5)
11404.10170	8766.36742	7-3 R2e(2.5)	11985.13336	8341.37771	10-5 P2e(1.5)
11410.24676	8761.64622	7-3 R2f(3.5)	11993.76923	8335.37764	10-5 Q1e(3.5)
11410.36934	8761.55210	7-3 R2e(3.5)	12000.21765	8330.89554	10-5 Q1f(3.5)
11410.63714	8761.34647	7-3 R1e(3.5)	12002.32236	8310.73002	6-2 R2e(0.5)
11410.72057	8761.28241	7-3 R1f(3.5)	12028.37079	8310.70536	6-2 R2f(0.5)
11770.55410	8493.44317	6-2 P2e(4.5)	12016.47119	8319.62408	10-5 Q1e(2.5)
11770.70332	8493.33549	6-2 P2f(4.5)	12016.66638	8319.48894	10-5 Q1f(2.5)
11809.39388	8465.50906	6-2 P1f(4.5)	12021.20656	8316.34882	10-5 Q2e(1.5)
11809.81380	8465.20805	6-2 P1e(4.5)	12021.50443	8316.14775	10-5 Q2f(1.5)
11827.30582	8452.68836	10-5 P2e(4.5)	12023.32236	8310.73002	6-2 R2e(0.5)
11827.32367	8452.67560	10-5 P2f(4.5)	12028.37079	8310.70536	6-2 R2f(0.5)
11827.90446	8452.26054	6-2 P2e(3.5)	12032.77204	8308.38330	10-5 Q1e(1.5)
11827.93467	8452.23895	6-2 P2f(3.5)	12032.77225	8308.35235	10-5 Q1f(1.5)
11858.75791	8430.26983	6-2 P1f(3.5)	12033.97710	8307.52441	10-5 Q2e(0.5)
11859.02624	8430.07908	6-2 P1e(3.5)	12034.15221	8307.40053	10-5 Q2f(0.5)
11867.90437	8423.77269	10-5 P1f(4.5)	12046.44787	8298.9223	6-2 R1e(1.5)
11868.30045	8423.49156	10-5 P1e(4.5)	12046.51954	8298.87185	6-2 R1f(1.5)
11879.91774	8415.25425	6-2 P2f(2.5)	12050.32997	8296.24780	6-2 R2f(1.5)
11879.98368	8415.20754	6-2 P2e(2.5)	12050.23187	8288.63710	6-2 R2e(1.5)
11887.42474	8409.93993	10-5 P2f(3.5)	12061.39443	8288.56225	6-2 R1f(2.5)
11887.50002	8409.88667	10-5 P2e(3.5)	12061.49462	8286.42676	6-2 R2f(2.5)
11902.59767	8399.21924	6-2 P1f(2.5)	12064.61171	8286.36233	6-2 R2e(2.5)
11902.73783	8399.12034	6-2 P1e(2.5)	12064.69546	8286.24859	10-5 R2f(0.5)
11907.6992	8395.62383	6-2 Q2e(4.5)	12070.34817	8282.47135	10-5 R2e(0.5)
11907.78093	8395.56318	6-2 Q2f(4.5)	12070.37330	8282.47135	10-5 R2e(0.5)
11919.37438	8387.59715	10-5 P1f(3.5)	12071.46953	8281.71920	6-2 R1e(3.5)
11919.61159	8387.33024	10-5 P1e(3.5)	12071.57749	8281.64514	6-2 R1f(3.5)
11926.42834	8382.43635	6-2 P2f(1.5)	12072.41166	8281.07889	6-2 R2f(3.5)
11926.55578	8382.34678	6-2 P2e(1.5)	12072.53592	8280.98766	6-2 R2e(3.5)
11928.84668	8380.73697	6-2 Q1e(4.5)	12078.42637	8276.94914	10-5 R2f(3.5)
11930.03377	8379.790305	6-2 Q1f(4.5)	12078.60550	8276.82639	10-5 R2e(3.5)
11934.44414	8376.00624	10-5 Q2e(4.5)	12081.56040	8274.80204	10-5 R2f(1.5)
11934.49893	8376.76919	10-5 Q2f(4.5)	12081.66134	8274.73290	10-5 R2e(1.5)
11935.18484	8376.28637	6-2 Q2e(3.5)	12084.20266	8272.99271	10-5 R2f(2.5)
11935.54443	8376.03409	6-2 Q2f(3.5)	12084.35772	8272.88856	10-5 R2e(3.5)
11940.06074	8372.08578	10-5 P2f(2.5)	12085.53488	8272.08875	10-5 R1f(1.5)
11940.19337	8372.77277	10-5 P2e(2.5)	12085.56285	8272.06161	10-5 R1f(1.5)
11951.35752	8364.95146	6-2 Q1e(3.5)	12088.88496	8269.78838	10-5 R1f(3.5)
11952.01673	8364.69009	10-5 Q1f(4.5)	12088.91052	8269.77889	10-5 R1e(3.5)
11968.50413	8361.02373	6-2 Q2e(2.5)	12090.61207	8268.60706	10-5 R1e(2.5)
11957.44530	8360.69267	6-2 Q2f(2.5)	12090.62883	8268.59559	10-5 R1f(2.5)
11963.04566	8356.77870	10-5 Q1e(4.5)	12415.74580	8052.07430	5-1 P2e(4.5)
11963.70857	8356.31564	10-5 P1f(2.5)	12415.91291	8051.9693	5-1 P2f(4.5)
11963.82357	8356.23532	10-5 P1e(2.5)	12456.15480	8025.95245	5-1 P1f(4.5)
11963.86534	8356.20615	10-5 Q1f(4.5)	12456.59686	8025.66762	5-1 P1e(4.5)
11968.50413	8352.96741	6-2 Q1e(2.5)	12474.61977	8014.07335	5-1 P2e(3.5)
11968.79483	8352.76453	6-2 Q1f(2.5)	12474.66144	8014.04558	5-1 P2f(3.5)
11971.23535	8351.06175	10-5 Q2e(3.5)	12507.12980	7993.42354	5-1 P1f(3.5)
11971.48803	8350.98751	10-5 Q2f(3.5)	12528.21525	7979.24111	5-1 P1e(3.5)
11972.86815	8349.92280	6-2 Q2e(1.5)	12528.78813	7979.78778	5-1 P2f(2.5)
11973.29877	8349.62249	6-2 Q2f(1.5)	12528.27703	7979.74255	5-1 P2e(2.5)
11980.46255	8344.62977	6-2 Q1e(1.5)	12555.1.95090	7964.69833	5-1 P1f(2.5)

TABLE 29—Continued

Wavenumber (cm ⁻¹)	Wavelength (Angstroms)	Identification	Wavenumber (cm ⁻¹)	Wavelength (Angstroms)	Identification
12552.10173	7964.60262	5-1 P1e(2.5)	12861.14889	7773.21613	9-4 Q1f(3.5)
12559.84235	7959.69402	5-1 Q2e(4.5)	12867.70373	7769.25641	9-4 Q2e(2.5)
12559.90716	7959.5295	5-1 Q2f(4.5)	12868.08813	7769.02432	9-4 Q2f(2.5)
12576.35152	7949.24516	5-1 P2f(1.5)	12882.94785	7760.06316	9-4 Q1e(2.5)
12576.48184	7949.16278	5-1 P2e(1.5)	12883.17093	7759.92879	9-4 Q1f(2.5)
12581.17442	7946.19786	5-1 Q1e(4.5)	12888.09565	7756.96360	9-4 Q2e(1.5)
12584.46172	7945.38488	5-1 Q1f(4.5)	12888.44059	7756.75582	9-4 Q2f(1.5)
12587.37907	7942.28095	5-1 Q2e(3.5)	12898.58012	7750.65841	9-4 Q1e(1.5)
12587.74224	7942.05180	5-1 Q2f(3.5)	12898.64004	7750.62240	9-4 Q1f(1.5)
12603.70397	7931.99369	5-1 Q1e(3.5)	12900.53199	7749.48571	9-4 Q2e(0.5)
12604.42180	7931.54195	5-1 Q1f(3.5)	12900.73462	7749.36399	9-4 Q2f(0.5)
12609.22844	7928.51843	5-1 Q2e(2.5)	12939.67504	7726.04069	9-4 R2f(0.5)
12609.72073	7928.20890	5-1 Q2f(2.5)	12939.6794	7726.04033	9-4 R2e(0.5)
12620.84737	7921.21929	5-1 Q1e(2.5)	12953.03940	7718.07165	9-4 R2f(1.5)
12621.16541	7921.01968	5-1 Q1f(2.5)	12953.11246	7718.02812	9-4 R2e(1.5)
12625.19526	7918.49135	5-1 Q2e(1.5)	12954.89941	7716.96352	9-4 R2f(3.5)
12625.64859	7918.20703	5-1 Q2f(1.5)	12954.98102	7716.91490	9-4 R1e(1.5)
12632.78309	7913.73512	5-1 Q1e(1.5)	12955.01948	7716.89200	9-4 R1f(1.5)
12632.86979	7913.68080	5-1 Q1f(1.5)	12955.04900	7716.87441	9-4 R2e(3.5)
12635.01684	7912.33604	5-1 Q2e(0.5)	12958.05280	7715.08556	9-4 R2f(2.5)
12635.28679	7912.16699	5-1 Q2f(0.5)	12958.17832	7715.01082	9-4 R2e(2.5)
12634.13052	7881.99886	5-1 R2e(0.5)	12962.18494	7712.62610	9-4 R1e(2.5)
12684.18358	7881.66589	5-1 R2f(0.5)	12962.22081	7712.60475	9-4 R1f(2.5)
12688.79198	7878.03336	9-4 P2e(4.5)	12962.88658	7712.20863	9-4 R1e(3.5)
12688.85878	7878.76188	9-4 P2f(4.5)	12962.89078	7712.20614	9-4 R1f(3.5)
12701.76626	7870.75548	5-1 R1e(1.5)	13062.54742	7653.36794	4-0 P2e(4.5)
12701.84678	7870.70558	5-1 R1f(1.5)	13062.73520	7653.25793	4-0 P2f(4.5)
12706.63896	7867.73721	5-1 R2f(1.5)	13104.68524	7628.75858	4-0 P1f(4.5)
12706.66178	7867.72308	5-1 R2e(1.5)	13105.14844	7628.48894	4-0 P1e(4.5)
12718.02501	7860.79344	5-1 R1e(2.5)	13123.07766	7612.20614	9-4 R1f(3.5)
12718.13937	7860.62275	5-1 R1f(2.5)	13123.13392	7618.03391	4-0 P2f(3.5)
12722.35091	7858.02060	5-1 R2f(2.5)	13156.81770	7598.53029	4-0 P1f(3.5)
12722.43836	7857.96659	5-1 R2e(2.5)	13157.11977	7598.35584	4-0 P1e(3.5)
12722.44142	7853.64353	5-1 R1e(3.5)	13178.36020	7586.88146	4-0 P2f(2.5)
12722.56883	7853.56492	5-1 R1f(3.5)	13178.41506	7586.07742	4-0 P2e(2.5)
12729.69449	7853.48740	9-4 P1f(4.5)	13203.27808	7571.79204	4-0 P1f(2.5)
12730.10813	7853.23221	9-4 P1e(4.5)	13203.43954	7553.52106	4-0 Q1e(4.5)
12731.54043	7852.34872	5-1 R2f(3.5)	13213.54886	7571.69945	4-0 Q2e(4.5)
12731.67168	7852.26777	5-1 R2e(3.5)	13213.59262	7565.88146	4-0 Q2f(4.5)
12749.51543	7841.27797	9-4 P2f(3.5)	13228.19516	7557.52947	4-0 P2f(1.5)
12749.55491	7841.25369	9-4 P2e(3.5)	13228.32663	7557.45436	4-0 P2e(1.5)
12781.62379	7821.58001	9-4 P1f(3.5)	13235.21490	7553.52106	4-0 Q1e(4.5)
12781.87592	7821.42573	9-4 P1e(3.5)	13236.60284	7552.72902	4-0 Q1f(4.5)
12803.03217	7808.50122	9-4 P2f(2.5)	13241.28274	7550.05963	4-0 Q2e(3.5)
12831.43217	7791.21846	9-4 Q1e(4.5)	13275.12663	7530.81124	4-0 Q2f(3.5)
12832.36111	7790.65445	9-4 Q1f(4.5)	13275.47271	7530.61492	4-0 Q1f(2.5)
12804.00380	7807.90867	9-4 Q2e(4.5)	13257.88963	7540.60234	4-0 Q1e(3.5)
12804.08576	7786.85869	9-4 Q2f(4.5)	13258.66691	7540.16028	4-0 Q1f(3.5)
12826.60688	7794.14948	9-4 P1f(2.5)	13263.31148	7537.51983	4-0 Q2e(2.5)
12836.73157	7794.07371	9-4 P1e(2.5)	13263.82378	7537.22870	4-0 Q2f(2.5)
12831.43437	7808.3279	9-4 P2e(2.5)	13241.65035	7549.85003	4-0 Q1e(2.5)
12839.60563	7786.25868	9-4 Q2e(3.5)	13279.43332	7528.36889	4-0 Q2e(1.5)
12839.90398	7786.07776	9-4 Q2f(3.5)	13279.91062	7528.09831	4-0 Q2f(1.5)
12839.15064	7780.47462	9-4 P2f(1.5)	13287.10723	7524.02089	4-0 Q1e(1.5)
12839.29384	7780.38791	9-4 P2e(1.5)	13287.20204	7523.96720	4-0 Q1f(1.5)
12830.63780	7773.52504	9-4 Q1e(3.5)	13289.36874	7522.74049	4-0 Q2e(0.5)

TABLE 29—Continued

Wavenumber (cm ⁻¹)	Wavelength (Angstroms)	Identification	Wavenumber (cm ⁻¹)	Wavelength (Angstroms)	Identification
13289.65475	7522.57859	4-0 Q2f(0.5)	13805.72149	7241.37816	8-3 R2e(2.5)
13340.89290	7493.68658	4-0 R2e(0.5)	13807.97937	7240.19404	8-3 R1e(2.5)
13340.95272	7493.65298	4-0 R2f(0.5)	13808.033350	7240.16566	8-3 R1f(2.5)
13359.05059	7483.50106	4-0 R1e(1.5)	13810.662883	7238.78721	8-3 R1e(3.5)
13359.14040	7483.45075	4-0 R1f(1.5)	13810.69444	7238.77067	8-3 R1f(3.5)
13364.84204	7480.25818	4-0 R2f(1.5)	14343.32189	6968.96322	7-2 P2e(4.5)
13364.86190	7480.24707	4-0 R2e(1.5)	14343.46065	6968.89579	7-2 P2f(4.5)
13376.54463	7472.71398	4-0 R1e(2.5)	14386.27551	6949.15261	7-2 P1f(4.5)
13376.67377	7473.64182	4-0 R1f(2.5)	14386.72478	6948.93560	7-2 P1e(4.5)
13381.88417	7470.73185	4-0 R2f(2.5)	14406.23520	6939.52457	7-2 P2e(3.5)
13381.97260	7470.68249	4-0 R1e(2.5)	14406.24899	6938.51793	7-2 P2f(3.5)
13389.19657	7466.65175	4-0 R1e(3.5)	14440.02198	6923.28736	7-2 P1f(3.5)
13389.34403	7466.56952	4-0 R1f(3.5)	14440.30363	6923.15232	7-2 P1e(3.5)
13392.322794	7464.90590	4-0 R2f(3.5)	14462.25816	6912.64251	7-2 P2f(2.5)
13392.46401	7464.83006	4-0 R2e(3.5)	14462.34017	6912.60331	7-2 P2e(2.5)
13523.499591	7392.2808	8-3 P2e(4.5)	14473.40344	6907.31938	7-2 Q2e(4.5)
13524.10422	7392.16887	8-3 P2f(4.5)	14473.49079	6907.27769	7-2 Q2f(4.5)
13565.73569	7369.48314	8-3 P1f(4.5)	14486.93538	6900.86735	7-2 P1f(2.5)
13566.16853	7369.4801	8-3 P1e(4.5)	14487.07925	6900.79882	7-2 P1e(2.5)
13585.68529	7358.66152	8-3 P2f(3.5)	14500.04617	6894.622762	7-2 Q1e(4.5)
13585.69396	7358.65683	8-3 P2e(3.5)	14501.18194	6894.08761	7-2 Q1f(4.5)
13618.45049	7340.95691	8-3 P1f(3.5)	14507.95263	6890.87020	7-2 Q2e(3.5)
13618.71848	7340.81245	8-3 P1e(3.5)	14508.30166	6890.70442	7-2 Q2f(3.5)
13640.34589	7329.17318	8-3 P2f(2.5)	14511.21571	6889.32067	7-2 P2f(1.5)
13640.44047	7329.12236	8-3 P2e(2.5)	14511.35303	6889.25547	7-2 P2e(1.5)
13646.80329	7325.70514	8-3 Q2e(4.5)	14528.26850	6883.23416	7-2 Q1e(3.5)
13646.89367	7325.65662	8-3 Q2f(4.5)	14528.89836	6880.93584	7-2 Q1f(3.5)
13664.31175	7316.31846	8-3 P1f(2.5)	14535.30259	6877.90409	7-2 Q2e(2.5)
13664.44665	7316.24623	8-3 P1e(2.5)	14535.75961	6877.68784	7-2 Q2f(2.5)
13673.63259	7311.33115	8-3 Q1f(4.5)	14549.78152	6889.05964	7-2 P2e(1.5)
13674.67077	7310.77607	8-3 Q1e(4.5)	14550.05889	6870.92865	7-2 Q1e(3.5)
13681.69765	7307.02125	8-3 Q2e(3.5)	14555.22464	6866.49010	7-2 Q2e(1.5)
13682.02752	7306.84508	8-3 Q2f(3.5)	14555.63918	6868.29448	7-2 Q2f(1.5)
13687.81893	7303.76349	8-3 P2f(1.5)	14564.80396	6868.79264	7-2 Q1e(1.5)
13687.95830	7303.67912	8-3 P2e(1.5)	14564.87912	6863.93722	7-2 Q1f(1.5)
13702.19220	7296.09198	8-3 Q1f(3.5)	14567.42505	6866.73761	7-2 Q2e(0.5)
13702.76599	7295.78646	8-3 Q1e(3.5)	14567.66993	6862.62224	7-2 Q2f(0.5)
13709.28260	7292.31844	8-3 Q2e(2.5)	14611.67886	6841.95256	7-2 R2e(0.5)
13709.70913	7292.09156	8-3 Q2f(2.5)	14611.71120	6841.93742	7-2 R2f(0.5)
13723.98600	7284.50566	8-3 Q1e(2.5)	14627.72526	6834.44699	7-2 R1e(1.5)
13724.23766	7275.37208	8-3 Q1f(2.5)	14627.78360	6833.41973	7-2 R1f(1.5)
13729.34118	7281.66429	8-3 Q2e(1.5)	14628.64409	6834.01772	7-2 R2f(1.5)
13729.72560	7281.46041	8-3 Q2f(1.5)	14628.68361	6833.99925	7-2 R2e(1.5)
13739.23083	7276.42284	8-3 Q1e(1.5)	14637.36904	6829.94411	7-2 R2f(2.5)
13798.60984	7245.11031	8-3 R2f(1.5)	14642.66903	6827.47196	7-2 R1e(3.5)
13798.66230	7245.08276	8-3 R2e(1.5)	14642.72566	6829.59301	7-2 R1f(3.5)
13798.97300	7244.91963	8-3 R1e(1.5)	14723.32083	6790.07199	10-4 P2e(4.5)
13799.02184	7244.89399	8-3 R1f(1.5)	14723.34508	6790.06081	10-4 P2f(4.5)
13804.59540	7241.96887	8-3 R2f(3.5)	14769.27589	6768.94433	10-4 P1f(4.5)
13804.72658	7241.90005	8-3 R2e(3.5)	14769.72220	6768.73978	10-4 P1e(4.5)
13805.61616	7241.43341	8-3 R2f(2.5)	14790.323397	6759.31139	10-4 P2f(3.5)

TABLE 29—Continued

Wavenumber (cm ⁻¹)	Wavelength (Angstroms)	Identification	Wavenumber (cm ⁻¹)	Wavelength (Angstroms)	Identification
14790.40526	6759.27424	10-4 P2e(3.5)	15320.09938	6525.56993	6-1 Q1f(4.5)
14822.30617	6742.90699	10-4 P1f(3.5)	15326.59075	6522.80609	6-1 Q2e(3.5)
14826.57265	6742.78580	10-4 P1e(3.5)	15326.94972	6522.65332	6-1 Q2f(3.5)
14830.46555	6741.51858	10-4 Q2e(4.5)	15327.41667	6522.45460	6-1 P2f(1.5)
14830.51194	6740.99477	10-4 Q2f(4.5)	15327.55476	6522.39584	6-1 P2e(1.5)
14838.39717	6732.87503	10-4 P2f(2.5)	15346.98652	6511.13737	6-1 Q1e(3.5)
14848.54282	6732.80899	10-4 P2e(2.5)	15347.67585	6513.84479	6-1 Q1f(3.5)
14864.41717	6732.61868	10-4 Q1e(4.5)	15353.91852	6511.19634	6-1 Q2e(2.5)
14865.28709	6725.22509	10-4 Q1f(4.5)	15354.39987	6510.99222	6-1 Q2f(2.5)
14874.13448	6721.22478	10-4 Q2e(3.5)	15368.40294	6505.05962	6-1 Q1e(2.5)
14874.39028	6721.10920	10-4 Q2f(3.5)	15368.70795	6504.93052	6-1 Q1f(2.5)
14874.88195	6720.88704	10-4 P1f(2.5)	15373.85648	6503.75208	6-1 Q2e(1.5)
14875.01051	6720.82895	10-4 P1e(2.5)	15374.29775	6505.56543	6-1 Q2f(1.5)
14897.27300	6710.78527	10-4 P2f(1.5)	15383.33232	6498.74648	6-1 Q1e(1.5)
14897.43482	6710.71238	10-4 P2e(1.5)	15383.41536	6498.71139	6-1 Q1f(1.5)
14900.25187	6709.44363	10-4 Q1e(3.5)	15386.08976	6497.58178	6-1 Q2e(0.5)
14900.73029	6709.28281	10-4 Q1f(3.5)	15386.35193	6497.47107	6-1 Q2f(0.5)
14908.55408	6705.70728	10-4 Q2e(2.5)	15432.79174	6477.91896	6-1 R2e(0.5)
14909.89666	6705.55320	10-4 Q2f(2.5)	15432.83274	6477.90175	6-1 R2f(0.5)
14927.64457	6697.13151	10-4 Q1e(2.5)	15449.321183	6470.98782	6-1 R1e(1.5)
14927.85331	6697.03786	10-4 Q1f(2.5)	15449.38932	6470.95955	6-1 R1f(1.5)
14933.49409	6694.50819	10-4 Q2e(1.5)	15451.31810	6470.15178	6-1 R2f(1.5)
14933.80589	6694.36842	10-4 Q2f(1.5)	15451.3516	6470.13764	6-1 R2e(1.5)
14946.85906	6688.52215	10-4 Q1e(1.5)	15461.30756	6465.97142	6-1 R1e(2.5)
14946.91512	6688.49706	10-4 Q1f(1.5)	15461.39342	6465.93552	6-1 R1f(2.5)
14948.67297	6687.71054	10-4 Q2e(0.5)	15461.55838	6465.86653	6-1 R2f(2.5)
14948.85699	6687.62821	10-4 Q2f(0.5)	15461.65004	6465.82820	6-1 R2e(2.5)
14981.32559	6673.13420	10-4 R2f(3.5)	15463.81757	6466.92189	6-1 R2f(3.5)
14981.51075	6673.05173	10-4 R2e(3.5)	15463.94131	6464.87016	6-1 R2e(3.5)
14985.04404	6671.7829	10-4 R2f(0.5)	15467.12866	6463.53792	6-1 R1e(3.5)
14985.07808	6671.46314	10-4 R2e(0.5)	15467.20649	6463.50539	6-1 R1f(3.5)
14994.53910	6668.14307	10-4 R2f(2.5)	15747.28093	6348.54735	9-3 P2e(4.5)
14992.70717	6668.06832	10-4 R2e(2.5)	15747.35933	6348.51574	9-3 P2f(4.5)
14993.84794	6669.56099	10-4 R2f(1.5)	15793.58764	6329.93329	9-3 P1f(4.5)
14993.96280	6667.50991	10-4 R2e(1.5)	15794.05289	6329.74683	9-3 P1e(4.5)
14993.81676	6666.98559	10-4 R1f(3.5)	15914.89247	6322.40594	9-3 P2f(3.5)
14995.87158	6666.66122	10-4 R1e(3.5)	15814.93356	6321.38951	9-3 P2e(3.5)
14999.67774	6664.06955	10-4 R1e(1.5)	15851.06255	6306.81119	9-3 P1f(3.5)
14999.70187	6664.95882	10-4 R1f(1.5)	15851.34497	6306.86882	9-3 P1e(3.5)
15001.79901	6664.02710	10-4 R1e(2.5)	15862.50435	6302.43185	9-3 P2e(4.5)
15001.80221	6664.02568	10-4 R1f(2.5)	15862.57471	6302.40390	9-3 Q2f(4.5)
15154.95748	6596.67887	6-1 P2e(4.5)	15873.85053	6297.92698	9-3 P2f(2.5)
15155.12039	6596.60796	6-1 P2f(4.5)	15873.97255	6285.59947	9-3 Q2e(3.5)
15199.40885	6577.38644	6-1 P1f(4.5)	15895.32533	6289.41836	9-3 Q1e(4.5)
15276.86441	6544.03805	6-1 P2f(2.5)	15923.92825	6278.12108	9-3 P2f(1.5)
15276.93825	6544.00642	6-1 P2e(2.5)	15924.08328	6278.05996	9-3 Q1f(2.5)
15279.11198	6537.51302	6-1 Q2e(4.5)	15930.07656	6275.69798	9-3 Q1e(3.5)
15292.18430	6533.08210	6-1 Q2f(4.5)	15930.61794	6275.48471	9-3 Q1f(3.5)
15302.49648	6533.07653	6-1 P1f(2.5)	15938.52220	6272.37253	9-3 Q2e(2.5)
15302.65096	6533.01058	6-1 P1e(2.5)	15938.91631	6272.21744	9-3 Q2f(2.5)
15318.86165	6526.09718	6-1 Q1e(4.5)	15956.61249	6265.26137	9-3 Q1e(2.5)

TABLE 29—Continued

Wavenumber (cm ⁻¹)	Wavelength (Angstroms)	Identification	Wavenumber (cm ⁻¹)	Wavelength (Angstroms)	Identification
15956.84972	6265.16823	9-3 Q1f(2.5)	16270.31378	6144.46242	5-0 R1f(1.5)
15962.87327	6262.80406	9-3 Q2e(1.5)	16273.21135	6143.38076	5-0 R2f(1.5)
15963.23034	6262.66397	9-3 Q2f(1.5)	16283.50569	6143.36835	5-0 R2e(1.5)
15965.85266	6261.79223	5-0 P2e(4.5)	16283.60557	6139.48451	5-0 R1e(2.5)
15965.63443	6261.72094	5-0 P2f(4.5)	16283.60557	6139.44685	5-0 R1f(2.5)
15975.19454	6257.97368	9-3 Q1e(1.5)	16284.78340	6139.00280	5-0 R2f(2.5)
15975.25851	6257.94462	9-3 Q1f(1.5)	16284.87784	6138.96720	5-0 R2e(2.5)
15977.72599	6256.98218	9-3 Q2e(0.5)	16288.34935	6137.65980	5-0 R2f(3.5)
15977.93656	6256.89972	9-3 Q2f(0.5)	16288.47902	6137.60994	5-0 R2e(3.5)
16011.61703	6243.73821	5-0 P1f(4.5)	16290.61132	6136.80393	5-0 R1e(3.5)
16012.10949	6243.54618	5-0 P1e(4.5)	16290.71554	6136.76731	5-0 R1f(3.5)
16016.87305	6241.68928	9-3 R2f(0.5)	16744.94168	5970.29887	8-2 P2e(4.5)
16016.88157	6241.68596	9-3 R2e(0.5)	16745.06161	5970.25611	8-2 P2f(4.5)
16020.27645	6240.36326	9-3 R2f(3.5)	16792.17502	5953.50535	8-2 P1f(4.5)
16020.42764	6240.30437	9-3 R2e(3.5)	16792.65357	5953.35569	8-2 P1e(4.5)
16027.81702	6237.42275	9-3 R2f(1.5)	16813.56005	5945.93307	8-2 P2f(3.5)
16027.90190	6237.39412	9-3 R2e(1.5)	16813.56906	5945.93988	8-2 P2e(3.5)
16028.87126	6237.01710	9-3 R2f(2.5)	16850.45559	5932.91381	8-2 P1f(3.5)
16029.00650	6236.96448	9-3 R2f(2.5)	16852.75032	5932.81002	8-2 P1e(3.5)
16031.42711	6236.02274	5-0 P2e(3.5)	16867.76067	5926.82702	8-2 Q2e(4.5)
16031.47035	6236.00592	5-0 P2f(3.5)	16867.83943	5926.77935	8-2 Q2f(4.5)
16031.59948	6235.95569	9-3 R1e(1.5)	16873.69974	5924.74093	8-2 P2f(2.5)
16031.63390	6235.94230	9-3 R1f(1.5)	16873.80202	5924.70501	8-2 P2e(2.5)
16032.32954	6235.67173	9-3 R1f(3.5)	16900.07192	5915.45542	8-2 Q1e(4.5)
16032.35563	6235.66158	9-3 R1e(3.5)	16900.55401	5915.32668	8-2 P1f(2.5)
16035.86373	6234.29742	9-3 R1e(2.5)	16900.70149	5915.27506	8-2 P1e(2.5)
16035.88545	6234.28897	9-3 R1f(2.5)	16901.15581	5915.11605	8-2 Q1f(4.5)
16067.99109	6221.83206	5-0 P1f(3.5)	16909.57241	5912.17182	8-2 Q2e(3.5)
16068.30670	6221.70986	5-0 P1e(3.5)	16909.90262	5912.05637	8-2 Q2f(3.5)
16090.64774	6213.07126	5-0 P2f(2.5)	16925.16424	5906.72535	8-2 P2f(1.5)
16090.71652	6213.04470	5-0 P2e(2.5)	16925.31347	5906.67327	8-2 P2e(1.5)
16109.56386	6205.77571	5-0 Q2e(4.5)	16934.19729	5903.57455	8-2 Q1e(3.5)
16109.61403	6205.75638	5-0 Q2f(4.5)	16934.79787	5903.36518	8-2 Q1f(3.5)
16117.17110	6202.75190	5-0 P1f(2.5)	16942.63644	5900.63394	8-2 Q2e(2.5)
16117.58240	6202.68829	5-0 P1e(2.5)	16943.07068	5900.48271	8-2 Q2f(2.5)
16136.63665	6195.36405	5-0 Q1e(4.5)	16960.22826	5894.51352	8-2 Q1e(2.5)
16137.97435	6194.85050	5-0 Q1f(4.5)	16960.49250	5894.42168	8-2 Q1f(2.5)
16142.59104	6192.96370	5-0 P2f(1.5)	16966.68649	5892.29980	8-2 Q2e(1.5)
16143.03141	6192.90985	5-0 P2e(1.5)	16967.08077	5892.13287	8-2 Q2f(1.5)
16144.18798	6192.46619	5-0 Q2e(3.5)	16978.42620	5888.19556	8-2 Q1e(1.5)
16144.54958	6192.322749	5-0 Q2f(3.5)	16978.49775	5888.17074	8-2 Q1f(1.5)
16164.85069	6184.55061	5-0 Q1e(0.5)	16981.38549	5887.16943	8-2 Q2e(0.5)
16165.59870	6184.26444	5-0 Q1f(3.5)	16981.61846	5887.08866	8-2 Q2f(0.5)
16171.66093	6181.94614	5-0 Q2e(2.5)	17023.14070	5872.72895	8-2 R2e(0.5)
16172.16021	6181.75528	5-0 Q2f(2.5)	17023.15279	5872.72478	8-2 R2f(0.5)
16186.31357	6176.34989	5-0 Q1f(1.5)	17032.4716	5867.51216	8-2 R1f(1.5)
16186.64609	6176.22301	5-0 Q1f(2.5)	17032.60168	5869.46684	8-2 R2e(3.5)
16191.73478	6174.28195	5-0 Q2e(1.5)	17035.95515	5868.31144	8-2 R2f(1.5)
16192.19816	6174.10525	5-0 Q2f(1.5)	17036.01747	5865.28998	8-2 R2e(1.5)
16201.25010	6170.65564	5-0 Q1e(1.5)	17038.17200	5867.54791	8-2 R1e(1.5)
16201.34106	6170.62099	5-0 Q1f(1.5)	17038.21721	5867.52334	8-2 R1f(1.5)
16204.07352	6169.58044	5-0 Q2e(0.5)	17038.97000	5867.27310	8-2 R2f(2.5)
16204.50063	6169.47494	5-0 Q2f(0.5)	17039.08304	5867.23118	8-2 R2e(2.5)
16253.19436	6150.93442	5-0 R2e(0.5)	17042.69477	5865.99077	8-2 R1e(3.5)
16253.24026	6150.91704	5-0 R2f(0.5)	17042.69953	5865.98913	8-2 R1f(3.5)
16270.23753	6144.49122	5-0 R1e(1.5)	17044.23421	5865.46094	8-2 R1e(2.5)

TABLE 29—Continued

Wavenumber (cm ⁻¹)	Wavelength (Angstroms)	Identification	Wavenumber (cm ⁻¹)	Wavelength (Angstroms)	Identification
17044.27576	5865.44665	8-2 R1f(2.5)	18839.37773	5306.55454	6-0 P2e(2.5)
17227.72527	5639.31639	7-1 P2e(4.5)	18841.83350	5305.86290	6-0 Q2e(4.5)
17227.87772	5639.26789	7-1 P2f(4.5)	18841.89117	5305.84666	6-0 Q2f(4.5)
17776.29048	5623.90949	7-1 P1f(4.5)	18867.96268	5298.51502	6-0 P1f(2.5)
17776.79039	5623.75134	7-1 P1e(4.5)	18868.13164	5298.46757	6-0 P1e(2.5)
17797.64059	5617.16296	7-1 P2e(3.5)	18874.32359	5296.72924	6-0 Q1e(4.5)
17797.65490	5617.15845	7-1 P2f(3.5)	18875.61201	5296.36777	6-0 Q1f(4.5)
17815.65098	5605.19184	7-1 P1f(3.5)	18883.39966	5294.18349	6-0 Q2e(3.5)
17835.96276	5605.09386	7-1 P1e(3.5)	18883.75705	5294.08329	6-0 Q2f(3.5)
17857.82050	5598.23323	7-1 Q2e(4.5)	18893.95619	5291.22546	6-0 P2f(1.5)
17857.89416	5598.21014	7-1 Q2f(4.5)	18894.10434	5291.18397	6-0 P2e(1.5)
17859.20483	5597.79928	7-1 P2f(2.5)	18908.13323	5287.25813	6-0 Q1e(3.5)
17859.29474	5597.77110	7-1 P2e(2.5)	18908.85216	5287.05693	6-0 Q1f(3.5)
17886.83418	5589.15241	7-1 P1f(2.5)	18916.35101	5284.96117	6-0 Q2e(2.5)
17886.99237	5589.10298	7-1 P1e(2.5)	18916.83335	5284.82474	6-0 Q2f(2.5)
17890.06115	5588.14424	7-1 Q1e(4.5)	18933.86914	5280.07133	6-0 Q1e(2.5)
17911.24755	5587.77368	7-1 Q1f(4.5)	18934.18863	5279.98223	6-0 Q1f(2.5)
17899.35854	5585.24159	7-1 Q2e(3.5)	18940.39599	5278.25180	6-0 Q2e(1.5)
17899.70705	5585.13284	7-1 Q2f(3.5)	18940.84732	5278.12602	6-0 Q2f(1.5)
17912.20404	5581.23616	7-1 P2f(1.5)	18951.79933	5275.07582	6-0 Q1e(1.5)
17912.35201	5581.19006	7-1 P2e(1.5)	18951.88663	5275.05152	6-0 Q1f(1.5)
17923.89750	5577.59495	7-1 Q1e(3.5)	18955.14644	5274.14434	6-0 Q2e(0.5)
17934.55749	5577.38958	7-1 Q1f(3.5)	18955.41577	5274.06940	6-0 Q2f(0.5)
17932.24926	5574.99722	7-1 Q2e(2.5)	19001.85558	5261.17962	6-0 R2e(0.5)
17932.71419	5571.95268	7-1 Q2f(2.5)	19001.88942	5261.17025	6-0 R2f(0.5)
17949.68033	5569.58324	7-1 Q1e(2.5)	19017.79310	5256.77053	6-0 R1e(1.5)
17949.97202	5569.49273	7-1 Q1f(2.5)	19017.85632	5256.75306	6-0 R1f(1.5)
17956.21297	5567.55695	7-1 Q2e(1.5)	19017.85761	5256.75270	6-0 R2f(1.5)
17956.63817	5567.42512	7-1 Q2f(1.5)	19017.90143	5256.74059	6-0 R2e(1.5)
17967.67374	5564.00562	7-1 Q1e(1.5)	19020.62639	5255.98745	6-0 R2f(3.5)
17967.75307	5563.98106	7-1 Q1f(1.5)	19020.74685	5255.95370	6-0 R2e(3.5)
17970.88701	5563.01074	7-1 Q2e(0.5)	19023.99087	5255.05792	6-0 R2f(2.5)
17971.13930	5562.93265	7-1 Q2f(0.5)	19024.08952	5255.03067	6-0 R2e(2.5)
18015.14823	5549.34290	7-1 R2e(0.5)	19026.78324	5254.28530	6-0 R1e(2.5)
18015.17316	5549.33522	7-1 R2f(0.5)	19026.85962	5254.26559	6-0 R1f(2.5)
18039.63241	5544.91705	7-1 R2f(3.5)	19028.30596	5253.86632	6-0 R1e(3.5)
18039.64983	5544.87941	7-1 R2e(3.5)	19028.35321	5253.85316	6-0 R1f(3.5)
18039.68260	5544.86933	7-1 R2e(1.5)			
18040.59921	5544.58745	7-1 R1e(1.5)			
18040.65338	5544.50709	7-1 R1f(1.5)			
18044.31571	5543.44481	7-1 R2f(2.5)			
18044.41783	5543.41342	7-1 R2e(2.5)			
18048.21854	5542.24539	7-1 R1e(2.5)			
18048.27506	5542.22803	7-1 R1f(2.5)			
18038.32815	5542.21171	7-1 R1e(3.5)			
18048.35466	5542.20357	7-1 R1f(3.5)			
18048.66434	5344.73447	6-0 P2e(4.5)			
18744.84190	5344.72273	6-0 P2f(4.5)			
18754.87109	5330.46536	6-0 P1f(4.5)			
18755.39204	5330.31729	6-0 P1e(4.5)			
18776.11719	5324.43360	6-0 P2e(3.5)			
18776.14950	5324.42444	6-0 P2f(3.5)			
18815.53363	5313.27938	6-0 P1f(3.5)			
18815.86227	5313.18658	6-0 P1e(3.5)			
18819.29690	5306.57731	6-0 P2f(2.5)			

TABLE 30
MEASURED AND CALIBRATED LINE POSITIONS AND INTENSITIES

Wavenumber (cm ⁻¹)	O-C (cm ⁻¹)	Wavelength (Angstroms)	Rel Int	Identification	Wavenumber (cm ⁻¹)	O-C (cm ⁻¹)	Wavelength (Angstroms)	Rel Int	Identification
2066.66367	0.00278	48373.97706	0.005	9-8 P2e(5.5)	2195.81010	-0.00594	45528.86432	0.006	-9 R1e(9.5)
2066.78683	0.00622	48371.09445	0.005	9-8 P2f(5.5)	2198.94430	0.00276	45463.97110	0.004	-9 R1f(10.5)
2088.9404	0.00484	47858.295637	0.001	9-8 P1f(5.5)	2198.94430	0.01660	45334.97110	0.004	-9 R1e(10.5)
2089.22457	0.00580	47851.60114	0.001	9-8 P1e(5.5)	2203.75369	0.15328	45334.97520	0.004	9-8 Q1e(6.5)
2100.44488	-0.00420	47595.98393	0.005	9-8 P2e(4.5)	2213.38260	0.00581	45167.40124	0.008	9-8 Q1e(5.5)
2100.49653	0.00429	47594.81357	0.007	9-8 P2f(4.5)	2214.35777	0.19251	45147.51019	0.007	9-8 Q1f(5.5)
2101.06184	-0.00364	47582.00775	0.008	9-9 R1e(1.5)	2221.29866	0.00226	45006.43779	0.010	9-8 Q1e(4.5)
2101.10007	0.00101	47581.14198	0.001	9-9 R1f(1.5)	2222.02385	0.00298	44991.74927	0.013	9-8 Q1f(4.5)
2105.63967	-0.00307	47478.56062	0.006	9-9 P2e(-1.5)	2227.67061	0.00015	44877.70295	0.018	9-8 Q1e(3.5)
2105.66118	0.00876	47469.72657	0.006	9-9 R2f(1.5)	2228.06335	0.00212	44869.79237	0.017	9-8 Q1f(3.5)
2105.66118	-0.01643	47478.52657	0.006	9-9 R2f(1.5)	2228.53816	-0.00394	44779.85714	0.028	9-8 Q1e(2.5)
2118.69361	0.01194	47186.03018	0.009	9-9 R1e(2.5)	2232.70710	-0.00283	44776.46883	0.039	9-8 Q1f(2.5)
2118.78184	-0.00562	47184.06527	0.006	9-9 R1f(2.5)	2233.66302	-0.00317	44757.30626	0.005	9-8 Q2f(1.5)
2119.56467	-0.00066	47166.3853	0.010	9-8 P1f(4.5)	2235.94525	-0.00609	44711.62245	0.069	9-8 Q1e(1.5)
2119.77681	-0.00218	47161.91825	0.010	9-8 P1e(4.5)	2235.99033	-0.00607	44710.72102	0.062	9-8 Q1f(1.5)
2124.6071	0.00077	47052.84403	0.006	9-9 R2f(2.5)	2236.04113	-0.00609	44709.70525	0.011	9-8 Q1f(0.5)
2124.76770	0.00046	47051.13909	0.005	9-9 P2e(-2.5)	2236.20696	-0.00776	44706.38972	0.015	9-8 Q2f(0.5)
2124.76722	-0.00526	47051.10543	0.005	9-9 R2e(2.5)	2237.15448	-0.00291	43911.70774	0.006	9-8 R2e(0.5)
2133.04753	0.00240	46868.50111	0.015	9-8 P2e(3.5)	2275.18842	-0.00628	43940.42212	0.006	9-8 R2f(0.5)
2133.07553	0.00243	46868.50111	0.015	9-8 P2f(3.5)	2278.78000	0.00372	43871.16771	0.010	9-6 P1f(9.5)
2134.89561	0.00749	46827.92922	0.010	9-9 R1e(3.5)	2279.48262	-0.00029	43857.64501	0.010	7-6 P1e(9.5)
2134.95558	0.00148	46825.73653	0.011	9-9 R1f(3.5)	2285.27883	-0.00025	43746.40774	0.008	7-6 P2f(8.5)
2141.61135	-0.00490	46681.08454	0.008	9-9 R2f(3.5)	2292.32764	-0.00254	43611.88938	0.007	9-8 R1e(1.5)
2141.71446	0.01050	46678.83214	0.008	9-9 P2e(-3.5)	2292.38163	-0.00324	43610.86223	0.007	9-8 R1f(1.5)
2141.71599	0.00620	46678.80379	0.008	9-9 R2e(3.5)	2298.32713	0.00446	43498.04608	0.010	9-8 R2e(1.5)
2148.66180	-0.00466	46525.90888	0.012	9-8 P1f(3.5)	2298.32713	-0.00627	43498.04608	0.010	9-8 R2f(1.5)
2148.79530	-0.00241	46525.01820	0.013	9-8 P1e(3.5)	2311.71702	0.00087	43246.09736	0.010	9-8 R1e(2.5)
2149.54696	0.00489	46508.74919	0.012	9-9 R1e(4.5)	2311.80674	0.00007	43244.41900	0.010	9-8 R1f(2.5)
2149.66019	0.00075	46506.29941	0.014	9-9 R1f(4.5)	2313.16150	-0.06071	43219.09184	0.010	6-5 P2e(11.5)
2156.34987	0.00940	46362.02213	0.008	9-9 R2f(4.5)	2313.78658	0.00233	43027.41600	0.009	6-5 P2f(11.5)
2156.51063	-0.00363	46358.56601	0.008	9-9 P2e(-4.5)	2316.94811	0.00161	43118.45846	0.014	7-6 P1f(8.5)
2156.51217	-0.00152	46358.53290	0.008	9-9 R2e(4.5)	2317.55798	0.0121	43137.10386	0.012	7-6 P1e(8.5)
2162.54099	0.00097	46229.39267	0.011	9-9 R1e(5.5)	2319.41255	-0.00028	43102.61202	0.008	9-8 R2f(2.5)
2162.65957	-0.00330	46226.75277	0.013	9-9 R1f(5.5)	2319.47063	0.00400	43101.53272	0.008	9-8 R2e(2.5)
2164.32275	-0.00176	46189.47409	0.001	9-8 P2f(2.5)	2322.08983	0.06054	43052.91637	0.005	8-7 P1f(3.5)
2164.44062	-0.00059	46188.71934	0.001	9-8 P2e(2.5)	2322.24047	0.06054	43050.12359	0.012	8-7 P1e(3.5)
2168.94403	-0.00088	46092.81702	0.006	9-9 R2f(5.5)	2323.99055	-0.00247	43027.41701	0.010	7-6 P2e(2.5)
2169.12504	-0.01079	46088.97065	0.011	9-9 P2e(-5.5)	2324.33019	-0.0121	43011.41800	0.010	7-6 P2f(7.5)
2169.16659	-0.00568	46088.93771	0.008	9-9 R2e(5.5)	2329.79721	0.00518	42910.48970	0.011	9-8 R1e(3.5)
2173.77085	-0.00694	45990.46871	0.009	9-9 R1e(6.5)	2329.92050	0.00247	42908.21905	0.011	9-8 R1f(3.5)
2173.88072	-0.00776	45988.14431	0.007	9-9 R1f(6.5)	2338.18553	0.00000	42756.54684	0.004	8-7 P1f(2.5)
2176.19859	-0.00521	45939.16231	0.014	9-8 P1f(2.5)	2338.25156	0.00000	42755.33943	0.006	8-7 P2e(2.5)
2176.27138	-0.00634	45937.62578	0.014	9-8 P1e(2.5)	2338.43272	0.00256	42752.02715	0.009	9-8 R2f(3.5)
2179.35374	-0.00943	45872.65408	0.006	9-9 R2f(6.5)	2338.53954	0.00582	42750.07432	0.009	9-8 R2e(3.5)
2179.54029	0.00650	45868.72277	0.007	9-9 R2e(6.5)	2346.46922	0.00715	42605.0429	0.012	9-8 R1e(4.5)
2179.54185	-0.00312	45868.69494	0.007	9-9 R2e(6.5)	2346.61658	0.00426	42602.92880	0.012	9-8 R1f(4.5)
2183.12363	-0.01036	45793.43965	0.010	9-9 R1e(7.5)	2350.65916	-0.03953	42529.66178	0.008	8-7 P1f(2.5)
2183.21886	-0.01227	45791.44218	0.014	9-9 R1f(7.5)	2350.74008	-0.03953	4228.19777	0.009	8-7 P1e(2.5)
2190.50035	-0.00901	45639.22583	0.006	9-9 R1e(8.5)	2351.57532	-0.01473	42513.09247	0.014	6-5 P1f(11.5)
2190.5213	-0.01342	45637.73034	0.009	9-9 R1f(8.5)	2352.49005	0.00014	42496.56190	0.011	6-5 P1e(11.5)
2194.43608	-0.00422	45557.37168	0.015	9-8 P2f(1.5)	2353.91592	0.00228	42470.81986	0.022	7-6 P1f(7.5)
2194.51522	-0.00248	45555.72876	0.014	9-8 P2e(1.5)	2354.43750	0.00096	42461.41128	0.019	7-6 P1e(7.5)
2195.81010	0.02558	45528.86432	0.006	9-9 R1f(9.5)	2355.39071	0.00400	42444.22744	0.009	9-8 R2f(4.5)
2356.08155	-0.0091	45589.22583	0.005	9-9 R1e(8.5)	2355.53879	0.00598	42441.55920	0.009	9-8 R2e(4.5)
2356.69587	-0.00206	45240.72143	-0.005	9-9 R1f(9.5)	2356.69587	-0.00206	42431.78213	0.014	6-5 P2e(10.5)

TABLE 30—Continued

Wavenumber (cm ⁻¹)	O-C (cm ⁻¹)	Wavelength (Angstroms)	Rel Int	Identification	Wavenumber (cm ⁻¹)	O-C (cm ⁻¹)	Wavelength (Angstroms)	Rel Int	Identification
2361.62010	0.00798	42332.26968	0.011	9-8 R1e(5.5)	2461.75849	0.00349	40610.29489	0.013	5-4 P2f(11.5)
2361.78383	0.00336	42329.33501	0.011	9-8 R1f(5.5)	2463.46361	-0.00318	40582.18591	0.012	4-3 P1f(15.5)
2362.15742	-0.00008	42322.64036	0.011	7-6 P2e(6.5)	2464.82005	-0.00158	40589.85271	0.018	4-3 P1e(15.5)
2362.41623	-0.00208	42318.00378	0.011	7-6 P2f(6.5)	2466.12609	0.000584	40538.37255	0.011	4-3 P2e(14.5)
2366.28597	-0.00552	42248.79841	0.010	4-3 P1f(17.5)	2467.14519	0.00089	40521.62742	0.013	4-3 P2f(14.5)
2367.81967	0.00445	42221.43273	0.001	4-3 P1e(17.5)	2472.81183	0.00193	40428.76895	0.042	6-5 P1f(8.5)
2369.68387	0.00046	42188.21766	0.010	4-3 P2f(16.5)	2473.31903	0.00182	40420.47828	0.005	8-7 R1e(1.5)
2370.29662	0.00290	42177.31150	0.007	9-8 R2f(5.5)	2473.45781	0.00069	40418.21038	0.038	6-5 P1e(8.5)
2370.47607	0.00430	42174.11859	0.008	9-8 R2e(5.5)	2479.70207	0.00017	40316.43127	0.027	6-5 P2e(7.5)
2375.14375	0.00563	42091.23716	0.010	9-8 R1e(6.5)	2480.07077	-0.00091	40310.43762	0.028	6-5 P2f(7.5)
2375.31296	0.00079	42088.23871	0.010	9-8 R1f(6.5)	2480.5674	-0.00148	40310.54034	0.084	8-7 R2f(1.5)
2383.15096	-0.00001	41949.81370	0.007	9-8 R2f(6.5)	2480.5674	-0.00291	40302.54034	0.084	8-7 R2e(1.5)
2383.35352	-0.00029	41946.24841	0.007	9-8 R2e(6.5)	2488.73881	-0.00309	40170.04019	0.004	2-1 P2f(19.5)
2386.14011	0.00051	41883.22043	0.008	9-8 R1e(7.5)	2494.27946	0.00081	40080.80874	0.008	8-7 R1e(2.5)
2387.10531	-0.00394	41880.32189	0.008	9-8 R1f(7.5)	2500.83360	-0.00050	39978.76565	0.025	5-4 P1f(11.5)
2389.62095	0.00103	41836.32396	0.012	7-6 P1f(6.5)	2501.78837	0.00120	39960.50949	0.027	5-4 P1e(11.5)
2390.05199	0.00071	41828.68790	0.012	7-6 P1e(6.5)	2503.47073	-0.00251	39933.65558	0.071	8-7 R2f(2.5)
2393.04949	-0.00509	41776.29397	0.026	6-5 P1f(10.5)	2503.52468	-0.0122	39952.79503	0.063	8-7 R2e(2.5)
2393.87611	0.00120	41761.86825	0.018	6-5 P1e(10.5)	2505.19045	0.00160	39906.24261	0.020	5-4 P2e(10.5)
2393.94113	-0.00269	41760.73399	0.006	9-8 R2f(7.5)	2505.31095	0.00558	39904.32321	0.007	3-2 P1f(17.5)
2394.15731	-0.00402	41756.963321	0.006	9-8 R2e(7.5)	2505.83973	0.00407	39895.90263	0.020	5-4 P2f(10.5)
2396.91798	-0.00688	41708.86918	0.007	9-8 R1e(8.5)	2506.88688	-0.02769	39879.20910	0.012	3-2 P1e(17.5)
2397.06827	-0.00817	41706.25424	0.007	9-8 R1f(8.5)	2508.65590	-0.02335	39851.11623	0.010	3-2 P2f(16.5)
2398.18844	0.00414	41686.77366	0.018	6-5 P2e(9.5)	2510.93993	0.00412	39914.86640	0.014	4-3 P1f(14.5)
2398.72178	-0.00116	41677.50488	0.014	6-5 P2f(9.5)	2510.97410	0.00373	39914.32458	0.049	6-5 P1f(7.5)
2399.36221	0.00236	41666.41518	0.007	7-6 P2e(9.5)	2511.52844	0.00117	39805.53684	0.052	6-5 P1e(10.5)
2402.64638	-0.00648	41609.42679	0.005	9-8 R2f(8.5)	2512.21338	-0.00236	39794.68409	0.021	4-3 P1e(14.5)
2402.86345	-0.00423	41605.66788	0.005	9-8 R2e(8.5)	2513.90177	0.00075	39767.95713	0.016	4-3 P2e(13.5)
2404.99156	-0.01021	41566.66841	0.005	9-8 R1f(9.5)	2514.03824	0.00021	39765.79840	0.009	8-7 R1e(3.5)
2405.11791	-0.00086	41495.81806	0.004	9-8 R2f(9.5)	2514.18555	0.00183	39763.46846	0.009	8-7 R1f(3.5)
2409.22443	-0.00264	41492.14904	0.004	9-8 R2e(9.5)	2514.83676	-0.00261	39753.17182	0.017	4-3 P2f(13.5)
2409.43747	0.00264	41492.14904	0.004	9-8 R2e(9.5)	2519.08623	-0.00107	39686.11181	0.039	6-5 P2e(6.5)
2411.07962	-0.01643	41392.88936	0.004	9-8 R1f(10.5)	2512.37142	-0.00031	39618.61938	0.033	6-5 P2f(6.5)
2411.17065	-0.00288	41462.32395	0.005	9-8 R1f(10.5)	2524.35710	-0.00193	39603.24700	0.070	8-7 R2f(3.5)
2412.61217	-0.01365	41437.55048	0.013	5-4 P1f(13.5)	2524.46451	-0.00045	39601.56197	0.074	8-7 R2e(3.5)
2415.09904	-0.00458	41394.88150	0.004	9-8 R1e(11.5)	2532.48848	-0.00047	39476.08783	0.010	8-7 R1e(4.5)
2415.22864	-0.06032	41394.66030	0.003	9-8 R1f(11.5)	2532.66904	0.00095	39473.27349	0.010	8-7 R1f(4.5)
2415.22881	-0.00341	41392.65735	0.008	4-3 P1f(16.5)	2542.23228	0.00264	39324.78491	0.007	2-1 P2f(18.5)
2416.67751	0.00000	41367.87837	0.012	4-3 P1e(16.5)	2543.52321	0.00152	39304.82615	0.040	5-4 P1f(10.5)
2416.96858	0.03311	41362.86230	0.004	9-8 R1e(12.5)	2544.38646	0.00170	39291.49096	0.042	5-4 P1e(10.5)
2416.96858	0.07200	41362.86230	0.004	9-8 R1f(12.5)	2547.88911	0.00247	39237.33730	0.063	6-5 P1f(6.5)
2417.65013	0.00438	41351.20186	0.010	4-3 P2e(15.5)	2548.35809	0.00125	39330.25494	0.060	6-5 P1e(6.5)
2418.75104	0.00058	41332.38059	0.013	4-3 P2f(15.5)	2548.50755	0.00241	39227.95424	0.035	5-4 P2e(9.5)
2439.40104	0.00138	40982.49396	0.023	6-5 P2e(8.5)	2549.73336	-0.00256	39119.24693	0.036	5-4 P2f(9.5)
2439.48266	-0.00061	41243.09313	0.012	4-3 P1e(16.5)	2557.63422	-0.00215	39087.97306	0.010	8-7 R1e(13.5)
2439.48266	-0.00150	41082.16593	0.028	6-5 P1f(9.5)	2549.51438	-0.00058	39212.46270	0.010	8-7 R1f(5.5)
2439.48266	0.02240	40699.45314	0.005	3-2 P2e(17.5)	2557.75411	0.00020	39086.14088	0.038	6-5 P2f(5.5)
2439.60175	-0.00142	40690.00489	0.010	7-6 P1f(4.5)	2557.89292	-0.00331	39119.65503	0.010	8-7 R1f(5.5)
2435.70021	-0.00006	41046.42248	0.008	7-6 P2e(4.5)	2555.56286	0.00189	39069.76650	0.016	3-2 P1f(16.5)
2435.70021	-0.00311	41044.76323	0.023	5-4 P1f(12.5)	2557.05897	-0.00772	39069.99263	0.020	4-3 P1e(13.5)
2439.40104	0.00138	40982.49396	0.023	6-5 P2e(8.5)	2557.55251	-0.00124	39089.22186	0.036	6-5 P2e(5.5)
2439.48266	-0.00140	40974.91946	0.022	6-5 P2f(8.5)	2557.63422	-0.00215	39087.97306	0.018	4-3 P1f(13.5)
2446.36564	0.02240	40699.45314	0.005	3-2 P2e(17.5)	2557.75411	0.00020	39086.14088	0.038	6-5 P2f(5.5)
2446.93601	-0.00142	40690.00489	0.010	7-6 P1f(4.5)	2557.89292	-0.00331	39119.65503	0.010	8-7 R1f(5.5)
2457.18189	-0.00713	40685.93321	0.023	5-4 P1f(12.5)	2558.81127	-0.00305	39069.99263	0.020	4-3 P1e(13.5)
2457.66200	-0.05129	40677.98511	0.011	3-2 P2f(17.5)	2559.03424	-0.00819	39066.58844	0.015	3-2 P2f(15.5)
2458.22368	0.00132	40668.69059	0.017	5-4 P1e(12.5)	2560.13655	-0.00005	39049.76766	0.073	8-7 R2f(5.5)
2461.02580	-0.00206	40622.38528	0.012	5-4 P2e(11.5)	2560.93084	0.00245	39037.65611	0.015	4-3 P2e(12.5)

TABLE 30—Continued

Wavenumber (cm ⁻¹)	O-C (cm ⁻¹)	Wavelength (Angstroms)	Rel Int	Identification	Wavenumber (cm ⁻¹)	O-C (cm ⁻¹)	Wavelength (Angstroms)	Rel Int	Identification
2561.78589	-0.00351	39024.62647	0.022	4-3 P2f(12.5)	2653.97381	-0.00691	37669.07433	0.009	3-2 P1f(14.5)
2565.00113	-0.00074	38975.60555	0.009	8-7 R1e(6.5)	2655.28664	0.00775	37650.44993	0.012	3-2 P1e(14.5)
2565.22885	-0.00052	38972.27936	0.009	8-7 R1f(6.5)	2655.57931	0.00534	37646.30050	0.013	7-6 R2f(1.5)
2575.06738	0.00147	3823.34813	0.002	8-7 R2f(6.5)	2656.81411	0.00150	37628.80373	0.008	3-2 P2e(13.5)
2575.28545	0.00358	38820.06064	0.063	8-7 R2e(6.5)	2657.79561	0.00226	37614.90774	0.012	3-2 P2f(13.5)
2578.87201	-0.00041	38766.07173	0.007	8-7 R1e(7.5)	2665.22299	0.00099	37510.08339	0.083	5-4 P1f(7.5)
2579.09660	-0.00168	38762.71097	0.008	8-7 R1f(7.5)	2665.80767	-0.00026	37459.85647	0.083	5-4 P1e(7.5)
2583.49941	0.00204	38696.65136	0.062	6-5 P1f(5.5)	2667.40439	0.00468	37479.40769	0.013	6-5 P2f(2.5)
2583.86576	0.00110	38691.16481	0.059	6-5 P1e(5.5)	2667.44315	0.00142	37478.86308	0.022	6-5 P2e(2.5)
2585.19394	0.00154	38671.27170	0.066	5-4 P1f(9.5)	2669.62903	-0.00012	37448.17555	0.014	7-6 R1e(2.5)
2585.96900	0.00106	38559.7105	0.079	5-4 P1e(9.5)	2669.74877	0.00459	37459.74598	0.013	7-6 R1f(2.5)
2588.03139	0.00321	38628.8845	0.050	8-7 R2f(7.5)	2673.19845	0.00114	37498.17242	0.069	5-4 P2e(6.5)
2588.26718	0.00485	38625.35445	0.050	8-7 R2e(7.5)	2673.50809	-0.00131	37433.84104	0.069	5-4 P2f(6.5)
2590.95582	0.00241	38585.27283	0.044	5-4 P2e(8.5)	2680.18159	0.00003	37300.73248	0.010	7-6 R2f(2.5)
2591.01447	0.00046	38584.32496	0.006	8-7 R1e(8.5)	2680.23931	-0.00486	37299.92920	0.010	7-6 R2e(2.5)
2591.23914	-0.00342	38581.05041	0.006	8-7 R1f(8.5)	2681.51865	-0.00126	37282.13357	0.012	6-5 P1f(2.5)
2591.43735	0.00118	38578.10308	0.050	5-4 P2f(8.5)	2681.61860	-0.00133	37280.74398	0.013	6-5 P1e(2.5)
2593.85526	-0.00152	38542.09720	0.004	2-1 P2e(17.5)	2690.92043	0.00330	37151.87387	0.024	7-6 R1e(3.5)
2595.10620	-0.00111	38523.56300	0.022	6-5 P2e(4.5)	2691.09397	0.00121	37149.47806	0.023	7-6 R1f(3.5)
2595.21941	0.00528	38521.88520	0.021	6-5 P2f(4.5)	2691.43690	-0.00054	37130.94689	0.048	4-3 P1f(10.5)
2599.01321	0.00402	38465.65180	0.022	8-7 R2f(8.5)	2693.33719	0.00068	37118.53709	0.051	4-3 P1e(10.5)
2599.25564	0.00611	38462.02123	0.022	8-7 R2e(8.5)	2696.00140	-0.00118	37051.85625	0.004	2-1 P1f(16.5)
2601.37235	-0.00008	38430.73640	0.005	8-7 R1e(9.5)	2697.27595	-0.00043	37064.33387	0.044	4-3 P2e(9.5)
2601.58224	-0.00650	38427.69698	0.005	8-7 R1f(9.5)	2697.54323	0.00014	37060.66143	0.009	2-1 P1e(16.5)
2603.47558	-0.00107	38399.67722	0.017	4-3 P1f(12.5)	2697.87379	-0.00066	37056.12053	0.044	4-3 P2f(9.5)
2604.56555	-0.00184	38383.66632	0.017	4-3 P1e(12.5)	2698.23232	-0.00512	37051.19657	0.009	2-1 P2e(15.5)
2605.13599	-0.00572	38375.24701	0.008	3-2 P1f(15.5)	2699.42669	0.00211	37034.80324	0.010	2-1 P2f(15.5)
2606.54138	0.00142	38354.55531	0.010	3-2 P1e(15.5)	2702.03024	-0.00392	36939.11823	0.015	3-2 P1f(13.5)
2607.19025	0.00183	38345.01034	0.014	4-3 P2e(11.5)	2702.03024	-0.01234	36999.11823	0.015	6-5 P2f(1.5)
2607.69950	0.00244	38337.57498	0.007	3-2 P2e(14.5)	2702.76162	-0.00228	36999.10609	0.017	7-6 R2f(3.5)
2607.96544	-0.00724	38333.61269	0.012	4-3 P2f(11.5)	2702.87600	-0.00136	36987.54079	0.022	7-6 R2e(3.5)
2607.98166	0.01120	38333.34488	0.015	8-7 R2f(9.5)	2703.25254	0.00896	36983.38874	0.024	3-2 P1e(13.5)
2608.23629	0.00597	38329.63197	0.016	8-7 R2e(9.5)	2703.43511	-0.00009	36979.891122	0.146	5-4 P1f(6.5)
2608.75955	-0.00058	38321.94988	0.008	3-2 P2f(14.5)	2703.92278	0.00045	36973.21666	0.138	5-4 P1e(6.5)
2609.86294	-0.00066	38305.74224	0.004	8-7 R1e(10.5)	2705.21093	0.00000	36955.61598	0.014	3-2 P2e(12.5)
2610.04580	-0.01002	38303.05854	0.004	8-7 R1f(10.5)	2706.16063	0.00287	36943.3915	0.015	3-2 P2f(12.5)
2617.68700	0.00239	38191.25047	0.032	6-5 P1e(4.5)	2710.98286	0.00039	36874.93409	0.032	7-6 R1e(4.5)
2617.96112	0.00063	38187.25047	0.032	6-5 P1f(4.5)	2711.19388	0.00046	36874.40385	0.028	7-6 R1f(4.5)
2625.78373	0.00101	38073.48480	0.060	5-4 P1f(8.5)	2712.92993	0.00068	36849.65252	0.090	5-4 P2e(5.5)
2626.46153	0.00062	38063.65933	0.057	5-4 P1e(8.5)	2713.21059	-0.00097	36846.65561	0.086	5-4 P2f(5.5)
2631.75013	-0.00040	37987.16897	0.015	6-5 P2e(3.5)	2723.36755	-0.00018	36709.36780	0.023	7-6 R2f(4.5)
2631.78083	0.00307	37988.72585	0.012	6-5 P2f(3.5)	2723.52791	-0.00018	36707.07238	0.016	7-6 R2e(4.5)
2632.52293	0.00041	37976.01751	0.043	5-4 P2e(7.5)	2729.68328	0.00188	36624.29880	0.029	7-6 R1e(5.5)
2632.91801	-0.00047	37970.31905	0.042	5-4 P2f(7.5)	2729.92651	0.00022	36621.03566	0.030	7-6 R1f(5.5)
2644.30779	0.00038	37806.65933	0.057	5-4 P1e(8.5)	2732.52850	-0.00068	36572.77958	0.005	1-0 P2f(17.5)
2645.9342	-0.00040	37783.49926	0.029	4-3 P1f(11.5)	2735.43720	0.00000	36547.26054	0.096	4-3 P1f(9.5)
2646.34573	0.00141	37777.65539	0.004	2-1 P2e(16.5)	2736.24368	0.00173	36546.48860	0.095	4-3 P1e(9.5)
2647.21273	0.00283	37765.28237	0.007	7-6 R1e(1.5)	2740.32894	-0.00002	36442.02029	0.144	5-4 P1f(5.5)
2647.29210	-0.00301	37764.15030	0.047	5-4 P2f(1.5)	2740.71982	0.00067	36446.81724	0.137	5-4 P1e(5.5)
2647.62271	-0.00220	37759.44893	0.007	2-1 P2f(16.5)	2741.05011	0.00065	36442.42187	0.078	4-3 P2e(8.5)
2648.42967	0.00058	37747.92961	0.029	4-3 P1f(11.5)	2741.56146	0.00075	36465.61911	0.079	4-3 P2f(8.5)
2649.42281	0.00018	37733.76549	0.030	4-3 P1e(11.5)	2742.02814	-0.00156	36449.41284	0.025	7-6 R2f(5.5)
2650.38118	0.00096	37720.13531	0.024	6-5 P1f(3.5)	2742.23212	-0.00259	36446.70882	0.019	7-6 R2e(5.5)
2650.56440	-0.00027	37717.52291	0.025	6-5 P1e(3.5)	2746.91768	0.00009	36394.51472	0.034	7-6 R1e(6.5)
2652.64742	0.00113	37687.90881	0.024	4-3 P2e(10.5)	2747.01836	0.00285	36393.18084	0.011	2-1 P1f(15.5)
2653.33373	-0.00279	37678.16147	0.024	4-3 P2f(10.5)	2747.18075	-0.00022	36391.02958	0.032	7-6 R1f(6.5)

TABLE 30—Continued

Wavenumber (cm ⁻¹)	O-C (cm ⁻¹)	Wavelength (Angstroms)	Rel Int	Identification	Wavenumber (cm ⁻¹)	O-C (cm ⁻¹)	Wavelength (Angstroms)	Rel Int	Identification
2748.47477	0.00042	36373.89617	0.010	2-1 P1e(15.5)	2842.14396	0.00128	35175.11306	0.086	5-4 P1f(2.5)
2749.26312	-0.00525	36363.46597	0.027	3-2 P1f(12.5)	2842.25359	0.00142	35173.75630	0.106	5-4 P1e(2.5)
2749.49035	0.00112	36360.46074	0.004	2-1 P2e(14.5)	2845.72222	-0.00089	35110.88325	0.120	3-2 P2e(9.5)
2750.39270	-0.00369	36448.53158	0.028	3-2 P1e(12.5)	2846.35204	-0.00127	35123.10975	0.111	3-2 P2f(9.5)
2750.59401	0.00371	36345.87111	0.010	2-1 P2f(14.5)	2846.85275	-0.00158	35116.93222	0.019	2-1 P1f(13.5)
2751.90707	0.00069	36328.52903	0.085	5-4 P2e(4.5)	2848.11914	0.00122	35101.31780	0.028	2-1 P1e(13.5)
2752.03795	0.00001	36326.80134	0.078	5-4 P2f(4.5)	2849.92848	-0.00177	35079.03295	0.020	2-1 P2e(12.5)
2752.85056	-0.10195	36316.07803	0.019	3-2 P2e(11.5)	2850.85831	0.00100	35067.59164	0.022	2-1 P2f(12.5)
2753.65687	0.00182	36305.44421	0.022	3-2 P2f(11.5)	2857.71794	0.00008	34983.41582	0.539	4-3 P1f(6.5)
2758.76995	-0.00076	36238.15601	0.020	7-6 R2f(6.5)	2858.23394	0.00306	34997.10022	0.526	4-3 P1e(6.5)
2759.00879	-0.00386	36193.01897	0.019	7-6 R2e(6.5)	2863.23968	0.00064	34655.95050	0.040	5-4 P2f(1.5)
2762.58366	0.00045	36188.12970	0.026	7-6 R1e(7.5)	2863.33693	0.00136	34914.76462	0.044	5-4 P2e(1.5)
2762.85857	0.00064	36184.52891	0.030	7-6 R1f(7.5)	2867.16694	0.00004	34866.12487	0.356	4-3 P2e(5.5)
2773.60630	-0.00272	36044.31375	0.015	7-6 R2f(7.5)	2867.40707	0.00156	34865.20485	0.358	4-3 P2f(5.5)
2773.86451	-0.00079	36040.95851	0.018	7-6 R2e(7.5)	2884.55656	0.00112	34657.92147	0.016	6-5 R1e(4.5)
2775.80715	0.00023	36015.73555	0.151	5-4 P1f(4.5)	2884.79347	0.00431	34655.07524	0.017	6-5 R1f(4.5)
2776.09963	0.00186	36011.94086	0.155	5-4 P1e(4.5)	2885.43133	0.00084	34647.41430	0.298	3-2 P1f(9.5)
2776.60052	0.00012	36005.44441	0.024	7-6 R1e(8.5)	2886.27360	-0.00187	34637.30352	0.277	3-2 P1e(9.5)
2776.88190	-0.00213	36001.79600	0.012	7-6 R1f(8.5)	2890.00700	-0.00302	34592.56797	0.007	1-0 P1f(15.5)
2777.36801	0.00002	35995.49477	0.204	4-3 P1f(8.5)	2890.90283	0.00014	34581.83847	0.201	3-2 P2e(8.5)
2778.07904	0.00255	35986.28197	0.205	4-3 P1e(8.5)	2891.44260	-0.00163	34575.30778	0.210	3-2 P2f(8.5)
2783.95878	0.00045	35910.27868	0.148	5-3 P2e(7.5)	2891.50779	0.00203	34655.60327	0.007	1-0 P1e(15.5)
2784.38413	0.00113	35904.824413	0.141	4-3 P2f(7.5)	2892.38355	0.00251	34564.13472	0.008	1-0 P2e(14.5)
2786.52619	-0.00115	35877.19217	0.016	7-6 R2f(8.5)	2893.53080	0.00446	34550.43045	0.008	1-0 P2f(14.5)
2786.80378	-0.00199	35873.61848	0.013	7-6 R2e(8.5)	2895.56041	-0.00237	34526.21272	0.038	2-1 P1f(12.5)
2787.46449	0.00053	35865.11539	0.008	1-0 P2f(16.5)	2895.95275	-0.00009	34687.46687	0.616	4-3 P1f(5.5)
2788.89772	-0.00331	35884.68411	0.018	7-6 R1e(9.5)	2896.37430	0.00248	34516.51074	0.604	4-3 P1e(5.5)
2789.17051	-0.00064	35843.17818	0.022	7-6 R1f(9.5)	2896.73141	0.00073	34512.25553	0.044	2-1 P1e(12.5)
2789.95514	0.00554	35833.09786	0.080	5-4 P2e(3.5)	2898.44507	0.00006	34491.85070	0.016	6-5 R2f(4.5)
2789.99782	0.00596	35832.54971	0.084	5-4 P2f(3.5)	2898.62019	-0.00304	34799.76688	0.010	6-5 R2e(4.5)
2795.61122	-0.00314	35760.60033	0.051	3-2 P1f(11.5)	2899.03363	-0.00050	34484.84819	0.029	2-1 P2e(11.5)
2796.64540	0.00224	35747.37631	0.057	3-2 P1e(11.5)	2899.87622	0.00041	34474.82824	0.033	2-1 P2f(11.5)
2797.32510	-0.00362	35738.69033	0.012	2-1 P1f(14.5)	2904.79471	0.00170	34416.45436	0.020	6-5 R1e(5.5)
2797.80348	0.00047	35732.57958	0.011	7-6 R2f(9.5)	2905.06967	0.00313	34413.74960	0.018	6-5 R2f(4.5)
2798.68556	-0.00152	35721.31761	0.011	2-1 P1e(14.5)	2906.62705	0.01441	34394.75819	0.001	5-4 Q1e(3.5)
2799.69914	-0.00388	35708.38525	0.029	3-2 P2e(10.5)	2907.25875	0.00701	34387.2777	0.001	5-4 Q1f(3.5)
2800.06718	-0.00010	35703.69175	0.010	2-1 P2e(13.5)	2907.49122	0.00013	34384.53532	0.386	4-3 P2e(4.5)
2800.41495	0.00056	35699.25788	0.037	3-2 P2f(10.5)	2907.63796	0.00120	34382.80032	0.392	4-3 P2f(4.5)
2801.08589	0.00144	35690.70689	0.009	2-1 P2f(13.5)	2911.03838	-0.03458	34342.63704	0.002	5-4 Q1e(2.5)
2806.84123	0.00554	35617.52420	0.011	7-6 R2e(10.5)	2911.31857	-0.01682	34339.33185	0.003	5-4 Q1f(2.5)
2809.77070	0.00086	35580.38932	0.108	5-4 P1f(3.5)	2914.09595	0.02017	34305.56070	0.004	5-4 Q1e(1.5)
2809.96838	0.00140	35577.88625	0.109	5-4 P1e(3.5)	2914.17478	0.00981	34305.67554	0.004	5-4 Q1f(1.5)
2813.61077	0.00364	35531.82851	0.010	7-6 R2f(11.5)	2914.57418	-0.01855	34309.97445	0.001	5-4 Q2e(0.5)
2813.88417	0.01656	35528.37620	0.010	7-6 R2e(11.5)	2914.81796	0.01441	34298.10569	0.001	5-4 Q2f(0.5)
2818.15581	0.00022	35447.52379	0.005	4-3 P1f(7.5)	2918.70175	0.00072	34249.46668	0.015	6-5 R2f(4.5)
2818.77016	0.00315	35466.79213	0.421	4-3 P1e(7.5)	2918.92049	0.00117	34249.89984	0.015	6-5 R2e(5.5)
2818.89477	0.0718	35465.22431	0.012	7-6 R2e(12.5)	2922.60307	0.00296	34249.04358	0.017	6-5 R1e(6.5)
2825.99546	0.00024	35316.11319	0.286	4-3 P2e(6.5)	2923.90774	0.00136	34191.48047	0.024	6-5 R1f(6.5)
2826.32792	0.00152	35371.95191	0.288	4-3 P2f(6.5)	2928.7474	0.00209	34124.66150	0.425	3-2 P1f(8.5)
2827.09569	0.00062	35362.34475	0.069	5-4 P2f(2.5)	2929.51917	-0.00283	34125.98742	0.438	3-2 P1e(8.5)
2827.13217	0.00061	35361.88945	0.080	5-4 P2e(2.5)	2932.76902	-0.00039	34088.17184	0.615	4-3 P1f(4.5)
2839.02999	-0.00216	35213.69464	0.007	1-0 P1e(16.5)	2933.08333	0.00176	34084.51894	0.591	4-3 P1e(4.5)
2839.58013	0.00364	35206.77234	0.007	1-0 P2e(15.5)	2935.22345	0.00102	34059.66734	0.336	3-2 P2e(7.5)
2840.81972	0.00090	35191.50984	0.011	1-0 P2f(15.5)	2935.67158	-0.00118	34054.46814	0.321	3-2 P2f(7.5)
2841.02112	-0.00110	35189.01511	0.168	3-2 P1f(10.5)	2937.06818	0.00054	34038.27496	0.008	6-5 R2f(6.5)
2841.95977	-0.00010	35177.39279	0.180	3-2 P1e(10.5)	2937.32621	0.00039	34035.28486	0.008	6-5 R2e(6.5)

TABLE 30—Continued

Wavenumber (cm ⁻¹)	O-C (cm ⁻¹)	Wavelength (Angstroms)	Rel Int	Identification	Wavenumber (cm ⁻¹)	O-C (cm ⁻¹)	Wavelength (Angstroms)	Rel Int	Identification
2940.88588	0.00231	33994.08828	0.012	6-5 R1e(7.5)	3042.07537	0.00002	32863.33215	0.117	2-1 P2f(8.5)
2941.00853	0.00011	33990.15914	0.014	6-5 R1f(7.5)	3043.21424	-0.00094	32851.03362	0.012	1-0 P1f(12.5)
2941.86346	-0.00226	33982.79206	0.009	1-0 P1f(14.5)	3044.42882	0.00049	32837.92764	0.015	1-0 P1e(12.5)
2943.27157	0.00038	33966.53412	0.010	1-0 P1e(14.5)	3046.58207	-0.00099	32814.71858	0.013	1-0 P2e(11.5)
2943.38829	-0.00132	33955.18718	0.067	2-1 P1f(11.5)	3047.45908	-0.00048	32805.27503	0.015	1-0 P2f(11.5)
2944.16355	0.00090	33952.8376	0.076	2-1 P1e(11.5)	3051.58102	0.00285	32760.96311	0.670	3-2 P1f(5.5)
2944.51079	0.00212	33952.23904	0.009	1-0 P2e(13.5)	3052.02178	-0.00196	32756.23191	0.658	3-2 P1e(5.5)
2945.56996	0.00294	33940.03047	0.008	1-0 P2f(13.5)	3056.06632	-0.00158	32712.88078	0.011	4-3 Q1e(5.5)
2946.98972	0.00005	33923.67931	0.347	4-3 P2e(3.5)	3058.01713	-0.00291	32692.01215	0.010	4-3 Q1f(5.5)
2947.04336	-0.00089	33921.06185	0.386	4-3 P2f(3.5)	3053.05643	0.00214	32739.22766	0.394	3-2 P2e(4.5)
2947.35251	-0.00004	33919.50364	0.049	2-1 P2e(10.5)	3063.21922	0.00040	32636.49316	0.396	3-2 P2f(4.5)
2948.10461	0.00004	33910.85033	0.061	2-1 P2f(10.5)	3064.53346	0.00602	32622.49683	0.015	4-3 Q1f(4.5)
2953.84487	0.00421	33844.95074	0.013	6-5 R2e(7.5)	3069.11016	-0.00141	32573.84970	0.031	4-3 Q1e(3.5)
2956.55954	0.00074	33813.87479	0.014	6-5 R1e(8.5)	3069.79331	0.00161	32566.55829	0.029	4-3 Q1f(3.5)
2956.89236	-0.00312	33810.06879	0.012	6-5 R1f(8.5)	3073.52088	-0.00158	32527.10390	0.059	4-3 Q1e(2.5)
2963.66558	0.00128	33732.79857	0.010	5-4 R2e(0.5)	3073.82372	0.00028	32523.89926	0.060	4-3 Q1f(2.5)
2963.74123	0.00005	33731.93753	0.010	5-4 R2f(0.5)	3074.55941	0.00069	32486.84216	0.009	4-3 Q2e(1.5)
2968.03759	-0.00076	33683.10913	0.046	4-3 P1f(5.5)	3075.38953	-0.00212	32511.63623	0.004	4-3 Q2f(1.5)
2968.23116	0.00062	33680.68556	0.516	4-3 P1e(3.5)	3076.57483	0.00018	32494.81599	0.134	4-3 Q1e(1.5)
2968.48601	0.00496	33678.02093	0.012	6-5 R2e(8.5)	3076.65969	-0.00195	32443.91972	0.134	4-3 Q1f(1.5)
2970.44838	0.00349	33654.63920	0.019	6-5 R1e(9.5)	3077.06533	0.00022	32489.63615	0.015	4-3 Q2e(0.5)
2970.97492	0.00289	33649.80744	0.705	3-2 P1f(7.5)	3077.32993	0.00032	32446.84257	0.003	4-3 Q2f(0.5)
2971.02012	-0.00302	33642.50137	0.698	3-2 P1e(7.5)	3080.99220	0.00054	32448.22656	0.252	2-1 P1f(8.5)
2978.68007	0.00150	33562.76322	0.520	3-2 P2e(6.5)	3081.77021	0.00182	32440.03482	0.255	2-1 P1e(8.5)
2979.03504	-0.00074	33558.76401	0.535	3-2 P2f(6.5)	3087.30317	0.00048	32331.89688	0.184	2-1 P2e(7.5)
2980.91472	-0.00067	33537.60280	0.010	6-5 R2f(9.5)	3087.77631	0.00003	32336.92871	0.182	2-1 P2f(7.5)
2982.80464	-0.00323	33516.35121	0.012	6-5 R1e(10.5)	3089.76689	0.00240	32335.07618	0.606	3-2 P1f(4.5)
2983.07051	0.07313	33513.36602	0.013	5-4 R1f(1.5)	3090.10255	-0.00137	32332.56152	0.604	3-2 P1e(4.5)
2983.07051	-0.01883	33515.36603	0.013	5-4 R1e(1.5)	3092.59720	0.00033	32336.46425	0.023	1-0 P1f(11.5)
2985.62735	-0.00023	33484.66574	0.262	4-3 R2e(2.5)	3093.71461	-0.00245	32331.78834	0.024	1-0 P1e(11.5)
2985.65990	-0.00052	33484.30068	0.316	4-3 P2e(2.5)	3096.44802	-0.00063	32286.26224	0.020	1-0 P2e(10.5)
2990.28008	-0.00087	33432.56522	0.144	2-1 P1f(10.5)	3097.23586	-0.00405	32228.04962	0.012	1-0 P2f(10.5)
2991.55713	0.00153	33381.52450	0.150	2-1 P1e(10.5)	3104.03928	-0.00249	32230.70271	0.230	3-2 P2e(3.5)
2991.74862	-0.00156	33416.15439	0.010	6-5 R2f(10.5)	3104.10517	-0.00451	32226.61906	0.297	3-2 P2f(3.5)
2992.94808	0.00084	33402.76246	0.012	1-0 P1f(13.5)	3124.66243	-0.00225	31994.73056	0.326	2-1 P1f(7.5)
2993.51793	0.00019	33396.03868	0.018	5-4 R2e(1.5)	3125.33989	0.00162	31936.95226	0.325	2-1 P1e(7.5)
2994.26211	0.00091	33388.10367	0.012	1-0 P1e(13.5)	3126.37605	0.00131	31977.19339	0.425	3-2 P1f(3.5)
2994.85225	-0.00097	33381.52450	0.116	2-1 P2e(9.5)	3126.60543	-0.00045	31974.84772	0.409	3-2 P1e(3.5)
2995.51268	-0.00014	33374.16477	0.119	2-1 P2f(9.5)	3128.56959	-0.00119	31954.77346	0.017	4-3 R2e(0.5)
2995.22513	-0.00074	33369.5013	0.006	1-0 P2e(12.5)	3128.65559	-0.00605	31933.89509	0.025	4-3 R2f(0.5)
2996.89282	0.00074	33358.79517	0.018	1-0 P2f(12.5)	3132.23656	0.00041	31917.36337	0.240	2-1 P2e(6.5)
3000.55661	-0.00287	33316.59248	0.012	6-5 R2f(11.5)	3132.61259	0.00080	31913.53210	0.228	2-1 P2f(6.5)
3001.67180	-0.00105	33305.68441	0.302	4-3 P1f(2.5)	3141.04136	-0.00028	31827.89429	0.032	1-0 P1f(10.5)
3001.79109	-0.00026	33304.36086	0.300	4-3 P1e(2.5)	3142.05768	-0.00059	31817.59934	0.036	1-0 P1e(10.5)
3007.60226	0.00356	33240.01147	0.015	6-5 R2f(12.5)	3144.20844	-0.00498	31795.83486	0.176	3-2 P2f(2.5)
3008.17192	0.13962	33233.71678	0.004	5-4 R1f(2.5)	3144.22597	0.00562	31795.65759	0.154	2-1 P2e(2.5)
3008.17192	-0.01481	33233.71678	0.004	5-4 R1e(2.5)	3145.49124	-0.00032	31782.86782	0.025	1-0 P2e(9.5)
3011.54445	0.00306	33192.09077	1.000	3-2 P1f(6.5)	3146.18357	-0.00258	31775.87388	0.030	1-0 P2f(9.5)
3012.48857	-0.00273	33186.09557	0.997	3-2 P1e(6.5)	3148.50840	-0.00211	31752.41085	0.028	4-3 R1e(1.5)
3021.28309	0.00137	33089.49560	0.509	3-2 P2e(5.5)	3148.61042	-0.00224	31751.38203	0.027	4-3 R1f(1.5)
3021.54250	-0.00020	33086.65475	0.384	3-2 P2f(5.5)	3159.96289	0.00593	31637.31210	0.029	4-3 R2f(1.5)
3023.32159	0.00035	33067.18472	0.083	4-3 P2f(1.5)	3159.96289	-0.00478	31637.31210	0.029	4-3 R2e(1.5)
3023.42335	-0.00051	33066.07177	0.090	4-3 P2e(1.5)	3161.29869	0.00000	31623.94382	0.219	3-2 P1f(2.5)
3036.17119	-0.00002	33927.23865	0.157	2-1 P1f(9.5)	3161.42657	0.00073	31622.66463	0.217	3-2 P1e(2.5)
3037.04954	0.00171	32917.71571	0.159	2-1 P1e(9.5)	3167.09360	0.00155	31566.08069	0.385	2-1 P1f(6.5)
3041.50740	-0.00011	32869.46904	0.115	2-1 P2e(8.5)	3167.66538	0.00210	31560.38284	0.381	2-1 P1e(6.5)

TABLE 30—Continued

Wavenumber (cm ⁻¹)	O-C (cm ⁻¹)	Wavelength (Angstroms)	Rel Int	Identification	Wavenumber (cm ⁻¹)	O-C (cm ⁻¹)	Wavelength (Angstroms)	Rel Int	Identification
3174.89228	0.00364	31488.5299	0.019	4-3 R1e(2.5)	3314.13755	0.00146	30165.53451	0.071	3-2 R1f(1.5)
3175.06715	-0.00071	31486.50872	0.019	4-3 R1f(2.5)	3322.00225	-0.00017	30094.11886	0.267	2-1 P1f (2.5)
3176.31531	0.00128	31474.33608	0.025	2-1 P2e (5.5)	3322.14101	0.00037	30092.86188	0.265	-2-1 P1e (2.5)
3176.5994	0.00070	31471.64526	0.026	2-1 P2f (5.5)	3323.97650	0.00103	30076.24469	0.276	1-0 P1f (6.5)
3183.47293	0.00042	31403.66956	0.114	3-2 P2f (1.5)	3324.57647	-0.00001	30070.81697	0.278	1-0 P1e (6.5)
3183.57399	0.00019	31402.65295	0.115	3-2 P2e (1.5)	3326.48981	0.00595	30053.52075	0.093	3-2 R2f (1.5)
3188.47827	0.00018	31354.37141	0.051	1-0 P1f (9.5)	3326.49881	-0.00464	30053.52075	0.093	3-2 R2e (1.5)
3189.14664	0.00645	31347.81993	0.051	4-3 R2f (2.5)	3333.08845	0.00058	29994.02265	0.199	1-0 P2e (5.5)
3189.21109	0.00583	31347.16667	0.008	4-3 R2e (2.5)	3333.38373	0.00015	29991.36570	0.195	1-0 P2f (5.5)
3189.39426	-0.00165	31345.36667	0.054	1-0 P1e (9.5)	3341.68285	-0.00104	29916.88166	0.073	3-2 R1e (2.5)
3193.68577	0.00000	31303.24617	0.044	1-0 P2e (8.5)	3341.86907	0.00097	29915.21459	0.076	3-2 R1f (2.5)
3194.28368	-0.00155	31297.40639	0.044	1-0 P2f (8.5)	3344.67695	0.00021	29890.10055	0.167	2-1 P2f (1.5)
3200.32863	-0.00004	31238.27061	0.010	4-3 R1e (3.5)	3344.78326	0.00064	29889.15053	0.164	2-1 P2e (1.5)
3200.56162	-0.00004	31235.97705	0.010	4-3 R1f (3.5)	3357.12502	0.00299	29677.26935	0.032	3-2 R2f (2.5)
3208.17433	0.00144	31161.87633	0.432	2-1 P1f (5.5)	3357.20111	-0.00018	29778.60328	0.038	3-2 R2e (2.5)
3208.63112	0.00196	31157.36235	0.430	2-1 P1e (5.5)	3356.54757	0.00124	29655.92083	0.659	1-0 P1f (5.5)
3209.76577	0.00547	31146.38708	0.004	3-2 Q1e (6.5)	3367.03747	0.00037	29691.60011	0.657	1-0 P1e (5.5)
3218.50382	0.00156	31091.85514	0.006	3-2 Q1e (6.5)	3388.41730	-0.00148	29679.43731	0.167	3-2 R1e (3.5)
3219.5870	0.00210	31051.43704	0.281	2-1 P2e (4.5)	3368.67487	0.00032	29677.16801	0.073	3-2 R1f (3.5)
3219.76155	0.00033	31049.73149	0.284	2-1 P2f (4.5)	3373.11611	-0.00142	29638.09332	0.011	2-1 Q1e (6.5)
3220.60227	-0.00719	31041.56830	0.008	3-2 Q1f (5.5)	3376.32053	0.00052	29659.96420	0.011	2-1 Q1f (6.5)
3225.79396	-0.00099	30991.66679	0.021	3-2 Q1e (4.5)	3377.88701	0.00128	29650.32370	0.455	1-0 P2e (4.5)
3227.1394	-0.00046	30978.81753	0.017	3-2 Q1f (4.5)	3378.07718	0.00032	29594.56657	0.460	1-0 P2f (4.5)
3227.67313	0.01617	30973.62326	0.005	3-2 Q2e (3.5)	3381.94546	0.00345	29560.71620	0.027	2-1 Q1e (5.5)
3228.0411	0.01152	30970.01567	0.003	3-2 Q2f (3.5)	3384.18082	0.00067	2957.12754	0.025	2-1 Q1f (4.5)
3231.64581	-0.00091	30935.54720	0.041	3-2 Q1e (3.5)	3384.39092	0.00170	29539.35560	0.012	2-1 Q2e (4.5)
3232.39492	0.00023	30928.40556	0.035	3-2 Q1f (3.5)	3384.42998	-0.00217	29519.01558	0.008	2-1 Q2f (4.5)
3233.10295	0.00122	30921.60473	0.012	3-2 Q2e (2.5)	3385.61074	0.00185	29528.71360	0.037	3-2 R2f (3.5)
3233.6.1651	0.00078	30916.75115	0.011	3-2 Q2f (2.5)	3385.76081	0.00256	29555.24266	0.028	3-2 R1e (4.5)
3234.83703	0.00026	30905.02876	0.086	1-0 P1f (8.5)	3389.32077	0.00208	29496.39077	0.055	2-1 Q1e (4.5)
3235.64336	-0.00014	30897.27941	0.096	1-0 P1e (8.5)	3390.75823	-0.00052	29483.88622	0.052	2-1 Q1f (4.5)
3236.08300	0.00086	30893.13912	0.085	3-2 Q1e (2.5)	3391.22340	-0.00333	29479.84195	0.010	2-1 Q2e (3.5)
3236.41445	0.00084	30889.97527	0.086	3-2 Q1f (2.5)	3391.58460	0.00661	29438.00299	0.017	Q2f (3.5)
3237.11614	-0.00009	30883.26589	0.018	3-2 Q2e (1.5)	3394.05555	-0.00358	29427.84408	0.023	2-1 Q2f (2.5)
3237.58720	-0.00272	30878.77646	0.010	3-2 Q2f (1.5)	3394.37147	0.00276	29452.50121	0.039	4-0 R1f (4.5)
3239.1576	0.00126	30863.87106	0.178	1-0 P1e (1.5)	3395.24089	0.00108	29437.97038	0.077	2-1 Q1e (3.5)
3239.24392	-0.00049	30862.99295	0.198	3-2 Q1f (1.5)	3396.04696	-0.00082	29437.97038	0.095	2-1 Q1f (3.5)
3239.64334	-0.00114	30859.12113	0.029	3-2 Q2e (0.5)	3396.68309	0.00616	29432.45724	0.010	2-1 Q2e (2.5)
3239.92797	-0.00040	30856.46728	0.037	3-2 Q2f (0.5)	3397.21556	-0.00067	29428.00256	0.028	3-2 R1e (4.5)
3241.01610	-0.00048	30846.10761	0.068	1-0 P2e (7.5)	3399.72656	0.00023	29452.50121	0.030	3-2 R1f (4.5)
3241.51527	-0.00272	30841.35753	0.069	1-0 P1f (7.5)	3400.08528	-0.00016	29403.06555	0.216	2-1 Q1f (2.5)
3247.7762	0.00151	30781.88935	0.455	2-1 P1f (4.5)	3400.74780	0.00137	29397.27855	0.223	2-1 Q2e (1.5)
3248.13375	0.00111	30778.51437	0.458	2-1 P1e (4.5)	3401.23890	-0.00078	29393.03374	0.025	2-1 Q2f (1.5)
3262.07550	0.00208	30646.92188	0.037	3-2 P2e (3.5)	3402.82306	-0.00032	29379.35002	0.512	2-1 Q1e (1.5)
3262.15433	-0.00164	30646.22978	0.266	2-1 P2f (3.5)	3402.92163	-0.00067	29378.49901	0.528	2-1 Q1f (1.5)
3280.03778	-0.00021	30479.15867	0.167	1-0 P1f (7.5)	3403.31896	-0.00006	29375.06913	0.049	2-1 Q2e (0.5)
3280.74159	0.00000	30472.60147	0.168	1-0 P1e (7.5)	3403.61315	-0.00073	29372.53011	0.086	2-1 Q2f (0.5)
3285.76280	0.00128	30426.03408	0.407	2-1 P1f (3.5)	3407.61102	0.00137	29338.06972	0.700	1-0 P1f (4.5)
3286.00983	0.00039	30423.75602	0.404	2-1 P1e (3.5)	3407.98772	0.00067	29334.82685	0.693	1-0 P1e (4.5)
3287.47790	-0.00001	30410.16060	0.119	1-0 P2e (6.5)	3412.05448	-0.00521	29399.86324	0.110	3-2 R2f (4.5)
3287.87445	-0.00125	30406.47434	0.114	1-0 P2f (6.5)	3412.26177	0.00593	29298.08332	0.069	2-1 Q2e (0.5)
3293.57054	-0.00027	30353.90609	0.047	3-2 R2e (0.5)	3418.43251	-0.00370	29245.19623	0.014	3-2 R1e (5.5)
3293.65768	-0.00118	30353.10302	0.045	3-2 R2f (0.5)	3418.79495	0.00662	29242.09583	0.014	3-2 R1f (5.5)
3303.80516	-0.00038	30259.87488	0.345	2-1 P2f (2.5)	3421.93101	0.00236	29215.29664	0.405	1-0 P2e (3.5)
3303.82261	0.00534	30259.68757	0.345	2-1 P2e (2.5)	3422.01465	0.00030	29214.58257	0.376	1-0 P2f (3.5)
3314.02700	-0.00039	30166.54078	0.072	3-2 R1e (1.5)	3436.79417	0.00791	29088.94872	0.010	3-2 R2e (0.5)

TABLE 30—Continued

Wavenumber (cm ⁻¹)	O-C (cm ⁻¹)	Wavelength (Angstroms)	Rel Int	Identification	Wavenumber (cm ⁻¹)	O-C (cm ⁻¹)	Wavelength (Angstroms)	Rel Int	Identification
3441.81158	0.01064	29046.54337	0.014	3-2 R1f(6.5)	3627.74931	-0.000001	27557.78273	0.179	1-0 R2e(0.5)
3447.01081	0.00119	29002.73158	0.698	1-0 P1f(3.5)	3627.84209	-0.00062	27557.07796	0.184	1-0 R2f(0.5)
3447.27196	0.00105	29000.53446	0.684	1-0 P1e(3.5)	3637.23915	-0.00589	27485.88261	0.006	2-1 R1e(7.5)
3459.68511	-0.00068	28896.48218	0.137	2-1 R2e	3637.71715	-0.00708	27482.27063	0.006	2-1 R1f(7.5)
3459.77344	-0.00033	28895.74444	0.141	2-1 R2f	3649.20141	0.00243	27395.78221	0.169	1-0 R1e(1.5)
3465.24616	0.00279	28850.10890	0.520	1-0 P2f(2.5)	3649.33254	0.00216	27394.79781	0.135	1-0 R1f(1.5)
3465.26811	0.00465	28784.93698	0.520	1-0 P2e(2.5)	3663.72104	0.00202	27387.21041	0.473	1-0 R2f(1.5)
3480.64534	0.00034	28722.46930	0.187	2-1 R1e(1.5)	3663.72104	-0.00344	27387.21041	0.473	1-0 R2e(1.5)
3480.76550	0.00099	28721.47776	0.271	2-1 R1f(1.5)	3679.38495	-0.00037	27171.04301	0.237	1-0 R1e(2.5)
3484.59762	0.00089	28689.89185	0.473	1-0 P1f(2.5)	3679.60157	-0.00065	27169.44343	0.312	1-0 R1f(2.5)
3484.74741	0.00071	28688.65863	0.483	1-0 P1e(2.5)	3697.22539	0.00107	27039.93296	0.150	1-0 R2f(2.5)
3494.12712	0.00309	28611.64615	0.317	2-1 R2f	3697.31433	-0.00087	27039.82426	0.179	1-0 R2e(2.5)
3494.12712	-0.00453	28611.64615	0.317	2-1 R2e(1.5)	3708.70182	-0.00066	26956.25888	0.261	1-0 R1e(3.5)
3507.75470	0.00003	28500.49025	0.252	1-0 P2f(1.5)	3708.99732	-0.00074	26954.11125	0.259	1-0 R1f(3.5)
3507.86909	0.00321	28499.62740	0.257	1-0 P2e(1.5)	3728.45178	0.00116	26813.46898	0.106	1-0 R2f(3.5)
3509.56233	0.00068	28485.81082	0.275	2-1 R1e	3728.62576	0.00017	26812.21785	0.100	1-0 R2e(3.5)
3509.76426	-0.00055	28484.17192	0.297	2-1 R1f(2.5)	3736.93806	-0.00091	26752.57777	0.146	1-0 R1e(4.5)
3526.28206	-0.00006	28351.06665	0.143	2-1 R2f(2.5)	3737.30206	-0.00063	26749.97216	0.157	1-0 R1f(4.5)
3537.58922	0.00064	28260.12917	0.122	2-1 R2e	3757.53956	0.00139	26660.90108	0.043	1-0 R2f(4.5)
3537.86534	-0.00051	28257.92335	0.225	2-1 R1f(3.5)	3763.90210	-0.00089	26560.92616	0.068	1-0 R1e(5.5)
3538.25377	0.00518	28254.82139	0.006	1-0 Q2e(6.5)	3764.32464	-0.0054	26557.94473	0.074	1-0 R1f(5.5)
3541.45618	-0.00027	28229.27157	0.006	1-0 Q2e(5.5)	3784.59420	0.00847	26415.70542	0.024	1-0 R2f(5.5)
3541.67321	-0.00322	28227.54171	0.001	1-0 Q1f(6.5)	3784.91729	-0.00053	26413.45051	0.023	1-0 R2e(5.5)
3547.23341	-0.00284	28183.29572	0.032	1-0 Q1e(5.5)	3789.44379	-0.00063	26381.89956	0.026	1-0 R1e(6.5)
3549.63091	-0.01113	28164.26009	0.006	1-0 Q1f(5.5)	3789.91373	0.0159	26378.62827	0.026	1-0 R2f(6.5)
3549.71293	0.00469	28163.60932	0.012	1-0 Q2f(4.5)	3809.71251	-0.00165	26241.54052	0.009	1-0 R2e(6.5)
3549.71293	-0.00215	28163.60932	0.012	1-0 Q2e(4.5)	3810.03577	-0.00262	26238.98489	0.008	1-0 R2e(6.5)
3554.71943	0.00006	28123.94342	0.669	1-0 Q1e(4.5)	3813.95967	0.00208	26212.31838	0.009	1-0 R1f(7.5)
3556.06088	0.00020	28113.33424	0.065	2-1 R2f	3836.36835	-0.00784	26059.20907	0.004	1-0 R2e(8.5)
3556.22209	0.00103	28112.06914	0.032	2-1 R2e	3841.14581	-0.00331	26026.79768	0.011	0-8 P2e(10.5)
3556.26292	-0.00753	28111.73705	0.006	1-0 Q1f(4.5)	3841.72397	0.00436	26022.88077	0.011	0-8 P2f(10.5)
3562.70814	-0.00334	28060.88068	0.027	1-0 Q2f(2.5)	3943.04301	-0.00572	25354.20572	0.008	0-8 P1e(9.5)
3566.51622	0.00739	28108.47445	0.015	1-0 Q2e(3.5)	3889.72290	-0.01141	25701.71833	0.008	0-8 P1f(10.5)
3556.99460	-0.00195	28105.95442	0.007	1-0 Q2f(3.5)	3890.73940	-0.00725	25652.04598	0.005	0-8 P1e(9.5)
3560.72951	0.00007	28076.73539	0.123	1-0 Q1e(3.5)	3897.23943	-0.00607	25652.18945	0.003	0-8 P2e(8.5)
3561.59491	-0.00085	28069.65153	0.013	1-0 Q1f(3.5)	3897.71901	-0.01220	25649.03331	0.005	0-8 P2f(9.5)
3562.16917	-0.00117	28064.12640	0.015	1-0 Q2e(2.5)	3902.17219	0.00301	25639.80643	0.010	0-8 P1f(9.5)
3562.70814	-0.00334	28060.88068	0.027	1-0 Q2f(2.5)	3943.04301	-0.00572	25354.20572	0.008	0-8 P1e(9.5)
3566.59469	0.00217	28046.54884	0.089	2-1 R1e(4.5)	3950.47649	-0.00439	25306.49753	0.007	0-8 P2e(8.5)
3564.86915	0.00130	28043.87028	0.106	2-1 R1f(4.5)	3950.83536	0.00400	25304.19884	0.009	0-8 P2f(8.5)
3565.28005	-0.00017	28040.63821	0.292	1-0 Q1e(2.5)	3951.63078	-0.0070	25058.37376	0.012	0-8 P1f(8.5)
3565.66791	-0.00090	28037.58805	0.030	1-0 Q1f(2.5)	3992.35697	0.00260	25041.02809	0.014	0-8 P1e(7.5)
3566.29058	-0.00086	28032.69272	0.073	1-0 Q2e(1.5)	4000.86142	0.00549	24987.79948	0.009	0-8 P2e(7.5)
3583.83300	-0.00082	27895.47610	0.035	2-1 R2f(4.5)	4048.59256	0.00327	24693.20408	0.012	0-8 P2f(6.5)
3584.06270	0.00200	27893.68830	0.037	2-1 R2e(4.5)	4075.38191	-0.00005	24510.88427	0.010	0-8 P1f(13.5)
3590.21164	-0.00342	27845.91488	0.029	2-1 R1e(5.5)	4076.86269	0.01085	24521.97427	0.015	9-7 P1e(13.5)
3568.90526	0.00043	28015.16337	0.061	1-0 Q1f(1.5)	4038.08296	0.00169	24757.47117	0.022	0-8 P1f(7.5)
3569.21477	0.00095	28012.15518	0.124	1-0 Q2e(0.5)	4038.67171	0.00755	24753.62027	0.019	0-8 P1e(7.5)
3609.61418	-0.00046	28009.72606	0.119	1-0 Q2f(0.5)	4048.41252	0.00823	24694.30223	0.014	0-8 P2e(6.5)
3609.90728	-0.00057	27693.38761	0.013	2-1 R2e(5.5)	4093.12017	0.00679	24491.31750	0.025	0-8 P1e(6.5)
3614.48306	-0.00387	27658.92820	0.020	2-1 R1e(6.5)	4093.12017	0.00810	24424.57529	0.018	0-8 P2e(5.5)
3614.92251	-0.00359	27655.56583	0.015	2-1 R1f(6.5)	4093.21467	0.00463	24424.01140	0.018	0-8 P2f(5.5)

TABLE 30—Continued

Wavenumber (cm ⁻¹)	O-C (cm ⁻¹)	Wavelength (Angstroms)	Rel Int	Identification	Wavenumber (cm ⁻¹)	O-C (cm ⁻¹)	Wavelength (Angstroms)	Rel Int	Identification
4121.86349	0.00140	24254.25336	0.025	0-8 P1f(5.5)	4362.77925	0.00817	22914.91559	0.010	0-8 R1e(3.5)
4122.21075	0.00465	24257.20105	0.029	0-8 P1e(5.5)	4362.85016	-0.00118	22914.9315	0.011	0-8 R1f(3.5)
4134.97492	0.01226	24177.34646	0.026	0-8 P2f(4.5)	4364.85961	0.00192	22903.99398	0.006	0-8 R2f(3.5)
4134.97492	-0.00533	24177.34646	0.026	0-8 P2e(4.5)	4364.99981	0.00737	22903.25832	0.006	0-8 R2e(3.5)
4135.80178	-0.00608	24172.51274	0.021	9-7 P1f(12.5)	4371.23004	0.01450	22870.61473	0.004	0-8 R1e(4.5)
4137.13240	-0.00776	24164.73817	0.015	9-7 P1e(12.5)	4371.28966	0.00633	230280.0	0.005	0-8 R1f(4.5)
4141.75139	-0.00948	24137.78948	0.017	9-7 P2e(11.5)	4372.02992	0.01039	22866.43039	0.005	0-8 R2f(4.5)
4142.51903	-0.00039	24133.31609	0.013	9-7 P2f(11.5)	4372.20596	0.00575	22865.50978	0.004	0-8 R2e(4.5)
4159.14710	-0.00166	24036.83220	0.025	0-8 P1f(4.5)	4375.44728	0.00260	22848.57106	0.005	0-8 R2f(5.5)
4159.38749	0.00125	24035.14307	0.024	0-8 P1e(4.5)	4375.63073	0.0036	22847.61312	0.005	0-8 R2e(5.5)
4173.86129	-0.00276	23952.09467	0.017	0-8 P2f(3.5)	4376.56629	0.01463	22842.72908	0.008	0-8 R1f(5.5)
4173.90090	-0.00058	23951.86736	0.017	0-8 P2e(3.5)	4376.56629	-0.01029	22842.72908	0.008	0-8 R1e(5.5)
4193.34395	-0.00438	23840.81098	0.022	0-8 P1f(3.5)	4378.57160	0.01084	22832.26750	0.008	0-8 R1e(6.5)
4193.50625	-0.00148	23839.88828	0.048	9-7 P1f(11.5)	4378.57160	-0.0694	22832.26750	0.008	0-8 R1f(6.5)
4193.50625	-0.01659	23839.88828	0.025	0-8 P1e(3.5)	4396.84812	0.00432	22837.35983	0.196	9-7 P1f(7.5)
4194.68771	-0.00943	23833.17362	0.033	9-7 P1e(11.5)	4397.46161	0.00564	22734.11773	0.194	9-7 P1e(7.5)
4200.03455	-0.00789	23802.83286	0.030	9-7 P2e(10.5)	4402.56982	-0.18793	22707.80971	0.007	7-5 P1f(18.5)
4200.68882	-0.00017	23799.17082	0.023	9-7 P2f(10.5)	4404.86394	-0.0511	22695.86394	0.008	7-5 P1e(18.5)
4209.75874	-0.00270	23747.85028	0.012	0-8 P2f(2.5)	4405.93527	-0.03901	22690.46446	0.004	7-5 P2e(17.5)
4209.83900	-0.00048	23747.39753	0.012	0-8 P2e(2.5)	4407.02772	0.00732	22684.833976	0.128	9-7 P2e(6.5)
4224.47476	-0.00626	23665.12425	0.013	0-8 P1f(2.5)	4407.25573	0.00446	22665.66616	0.125	9-7 P2f(6.5)
4224.55260	-0.00858	23664.68821	0.014	0-8 P1e(2.5)	4415.05117	-0.01209	22643.61470	0.028	8-6 P1f(13.5)
4224.55260	-0.00523	23564.24697	0.008	0-8 P2f(1.5)	4416.53772	0.00711	22635.99314	0.022	8-6 P1e(13.5)
4242.66250	-0.00873	23563.67490	0.008	0-8 P2e(1.5)	4420.20570	-0.01847	22617.20930	0.021	8-6 P2e(12.5)
4248.49011	-0.00441	23531.31960	0.081	9-7 P1f(10.5)	4421.12696	-0.00133	22612.39411	0.018	8-6 P2f(12.5)
4249.52099	-0.00452	23525.64442	0.067	9-7 P1e(10.5)	4440.65082	0.00391	22613.00776	0.237	9-7 P1f(6.5)
4254.61303	-0.01593	23497.68825	0.001	0-8 Q1e(4.5)	4441.13903	0.00567	22510.60292	0.238	9-7 P1e(6.5)
4254.91822	0.02295	23495.69242	0.003	0-8 Q1f(4.5)	4452.23229	0.00678	22454.51507	0.149	9-7 P2e(5.5)
4255.70086	-0.00205	23492.18199	0.047	9-7 P2e(9.5)	4452.36940	0.0365	22453.82359	0.148	9-7 P2f(5.5)
4256.23742	-0.00092	23488.52045	0.046	9-7 P2f(9.5)	4474.65203	-0.13759	22442.00918	0.009	7-5 P1f(17.5)
4267.28225	0.03642	23427.72605	0.008	0-8 Q1e(3.5)	4475.25364	-0.0346	22339.00573	0.035	8-6 P1e(12.5)
4267.64686	-0.05246	23425.72448	0.007	0-8 Q1f(3.5)	4476.58534	0.00639	22332.36030	0.034	8-6 P1e(12.5)
4277.23371	-0.02049	23373.21881	0.010	0-8 Q1e(2.5)	4476.77499	-0.00117	22331.41423	0.111	7-5 P1e(17.5)
4300.73319	-0.00036	23372.36074	0.009	0-8 Q1f(2.5)	4478.23160	-0.01627	22324.15061	0.008	7-5 P2e(16.5)
4301.61499	0.00010	23240.74082	0.112	9-7 P1e(9.5)	4479.74753	-0.01122	22316.59619	0.008	7-5 P2f(16.5)
4308.75656	0.00224	23202.22031	0.080	9-7 P2e(8.5)	4480.89774	-0.01234	22310.86770	0.029	8-6 P1f(11.5)
4309.18460	0.00170	23199.91559	0.077	9-7 P2f(8.5)	4481.56069	0.00199	22307.56779	0.269	9-7 P1f(5.5)
4320.55108	-0.00389	23138.88135	0.009	0-8 R2f(0.5)	4481.93062	0.00399	22306.81494	0.018	8-6 P2f(11.5)
4320.55108	-0.00457	23050.77503	0.012	0-8 R1f(1.5)	4534.66026	-0.00942	22305.72666	0.276	9-7 P1e(5.5)
4328.22809	-0.25525	23097.83937	0.009	0-8 R2e(0.5)	4519.53794	-0.00112	22310.11879	0.283	9-7 P1e(4.5)
4330.62625	-0.00001	23084.74824	0.004	7-5 P1e(19.5)	4519.79943	0.00088	22118.83917	0.282	9-7 P1e(4.5)
4331.40113	-0.06603	23080.91901	0.006	7-5 P2e(18.5)	4532.93258	0.00092	22054.75466	0.065	8-6 P1f(11.5)
4350.94017	0.00378	22977.26802	0.178	9-7 P1e(8.5)	4534.11593	0.00385	22048.99863	0.057	8-6 P1e(11.5)
4351.31716	0.01485	22975.27731	0.027	0-8 R1e(2.5)	4548.29773	-0.00552	21980.24880	0.306	9-7 P2e(15.5)
4337.06539	-0.00457	23039.79317	0.008	0-8 R2f(1.5)	4539.15176	-0.00319	22024.53699	0.051	8-6 P2e(10.5)
4339.13264	-0.00320	23039.53555	0.011	0-8 R2e(1.5)	4539.85080	0.00186	22021.14568	0.044	8-6 P2f(10.5)
4339.18116	0.00083	23081.19981	0.175	9-7 P1f(8.5)	4544.46133	-0.09604	21998.80437	0.010	7-5 P1f(16.5)
4350.19578	0.00253	22981.21216	0.016	8-6 P2f(13.5)	4546.42010	0.00337	21989.32645	0.010	7-5 P1e(16.5)
4350.19578	-0.00371	22939.21216	0.125	9-7 P2e(7.5)	4548.87145	-0.02713	21881.27123	0.001	9-7 Q1f(7.5)
4359.19955	0.00586	22933.73294	0.109	9-7 P2f(7.5)	4569.90379	-0.39651	21876.32826	0.009	6-4 P2f(19.5)

TABLE 30—Continued

Wavenumber (cm ⁻¹)	O-C (cm ⁻¹)	Wavelength (Angstroms)	Rel Int	Identification	Wavenumber (cm ⁻¹)	O-C (cm ⁻¹)	Wavelength (Angstroms)	Rel Int	Identification
4571.70630	-0.00428	21867.70296	0.114	9-7 P2f (2.5)	4735.82011	0.00233	21109.90509	0.135	9-7 R1f (3.5)
4571.77714	-0.00329	21867.36412	0.124	9-7 P2e (2.5)	4737.74310	0.00067	21101.33684	0.302	8-6 P1f (7.5)
4586.63134	-0.00439	21796.54473	0.157	9-7 P1f (2.5)	4738.38051	-0.00182	21088.49827	0.303	8-6 P1e (7.5)
4586.71754	-0.00581	21796.13510	0.154	9-7 P1e (2.5)	4740.03655	-0.00034	21091.12702	0.060	9-7 R2f (3.5)
4587.72839	0.00413	21791.33259	0.001	9-7 Q1e (6.5)	4740.10422	-0.02521	21090.82592	0.001	7.5 P1f (13.5)
4588.05968	0.00226	21789.75910	0.095	8-6 P1f (10.5)	4740.15266	0.01245	21090.61040	0.053	9-7 R2e (3.5)
4589.09911	0.00089	21784.81992	0.095	8-6 P1e (10.5)	4741.59999	0.00096	21084.17268	0.023	7-5 P1e (13.5)
4589.53978	0.00369	21782.33202	0.001	9-7 Q1f (6.5)	4744.99472	0.00156	21069.80833	0.021	7-5 P2e (12.5)
4594.97241	-0.00101	21756.97831	0.073	8-6 P2e (9.5)	4745.97043	0.00153	21064.75680	0.026	7-5 P2f (12.5)
4595.55796	0.00053	21754.20611	0.071	8-6 P2f (9.5)	4746.49553	0.00652	21062.42642	0.108	9-7 R1e (4.5)
4605.87966	-0.00626	21705.45526	0.085	9-7 P2f (9.5)	4746.59091	0.00373	21062.00319	0.114	9-7 R1f (4.5)
4607.25036	0.00417	21698.95768	0.002	9-7 Q1f (5.5)	4747.72997	-0.00001	21056.95006	0.222	8-6 P2e (6.5)
4611.99115	-0.06857	21676.69268	0.013	7-5 P1f (15.5)	4747.99855	-0.00023	21055.75893	0.220	8-6 P2f (6.5)
4613.79112	0.00015	21668.35959	0.015	7-5 P1e (15.5)	4749.74053	0.00280	21048.03667	0.048	9-7 R2f (4.5)
4616.12707	-0.00547	21657.27096	0.013	7-5 P2e (14.5)	4749.89580	0.00620	21047.34862	0.054	9-7 R2e (4.5)
4617.55483	0.00485	21651.51227	0.014	7-5 P2f (14.5)	4752.91907	0.00416	21033.96067	0.005	9-7 R2f (8.5)
4621.27140	0.00333	21633.16240	0.004	9-7 Q1e (4.5)	4753.05738	-0.00194	21033.34860	0.007	9-7 R2e (8.5)
4622.04860	0.00391	21629.56947	0.003	9-7 Q1f (4.5)	4753.69992	-0.00327	21030.50560	0.011	9-7 R1f (9.5)
4624.74346	-0.00192	21616.92113	0.001	9-7 Q2e (3.5)	4753.81886	-0.00848	21029.97942	0.009	9-7 R1e (9.5)
4633.55966	0.00057	21575.74437	0.006	9-7 Q1e (3.5)	4754.32457	0.00776	21027.74249	0.074	9-7 R1e (5.5)
4633.99313	0.00109	21573.77270	0.007	9-7 Q1f (3.5)	4754.40885	0.00214	21027.36973	0.075	9-7 R1f (5.5)
4636.37688	-0.00310	21562.68074	0.001	9-7 Q2e (2.5)	4755.87746	0.00359	21020.87650	0.037	9-7 R2f (5.5)
4636.71833	-0.00053	21561.09286	0.006	9-7 Q2f (2.5)	4756.04941	0.00359	21020.11651	0.040	9-7 R2e (5.5)
4640.59929	0.00218	21543.06118	0.147	8-6 P1f (9.5)	4757.48623	-0.00327	21013.76817	0.012	9-7 R2f (7.5)
4641.50044	-0.00067	21538.87858	0.012	8-6 P1e (9.5)	4757.64654	-0.00040	21013.06011	0.011	9-7 R2e (7.5)
4642.97021	-0.00242	21532.06027	0.012	9-7 Q1e (2.5)	4758.46060	0.00030	21009.46527	0.022	9-7 R2f (6.5)
4643.15257	-0.00161	21531.21459	0.012	9-7 Q1f (2.5)	4758.63144	0.00299	21008.71100	0.025	9-7 R2e (6.5)
4644.03620	-0.32599	21527.11780	0.006	6-4 P1e (19.5)	4760.66304	-0.00016	20999.74559	0.053	9-7 R1f (7.5)
4644.82349	-0.00502	21523.46899	0.002	9-7 Q2e (1.5)	4760.66304	-0.00552	20999.74559	0.053	9-7 R2f (7.5)
4645.12574	-0.00409	21522.06849	0.002	9-7 Q2f (1.5)	4782.24542	0.00036	20914.97520	0.387	8-6 P1f (6.5)
4646.36777	-0.26481	21516.31538	0.008	6-4 P2f (18.5)	4782.75874	-0.00179	20902.72953	0.389	8-6 P1e (6.5)
4648.34747	-0.00017	21507.15172	0.115	8-6 P2e (8.5)	4788.19210	-0.26540	20879.01032	0.008	6-4 P1f (17.5)
4648.42352	-0.00042	21504.93943	0.106	8-6 P2f (8.5)	4790.31647	-0.14085	20867.75106	0.025	9-7 R1e (6.5)
4649.56125	-0.00350	21501.53722	0.023	9-7 Q1e (1.5)	4791.53911	-0.12789	20844.42580	0.009	6-4 P2e (16.5)
4649.61199	-0.00553	21501.30258	0.023	9-7 Q1f (1.5)	4793.05894	-0.02525	20857.69240	0.007	6-4 P2f (16.5)
4649.99049	-0.00697	21499.55242	0.005	9-7 Q2e (0.5)	4793.71953	-0.00026	20854.93562	0.273	8-6 P2e (5.5)
4650.16608	-0.00624	21498.74059	0.004	9-7 Q2f (0.5)	4793.89239	-0.00032	20854.13624	0.271	8-6 P2f (5.5)
4677.21166	-0.04328	21374.42587	0.020	7-5 P1f (14.5)	4800.64374	-0.01839	20824.85548	0.037	7-5 P1f (12.5)
4678.85686	0.00190	21366.91099	0.017	7-5 P1e (14.5)	4801.98623	0.00133	20819.03347	0.034	7-5 P1e (12.5)
4681.68915	0.00477	21353.98370	0.014	7-5 P2e (13.5)	4806.00997	0.00352	20810.60312	0.028	7-5 P2e (11.5)
4682.79746	0.00002	21348.92971	0.019	7-5 P2f (13.5)	4806.86903	-0.00211	20744.19680	0.029	7-5 P1f (11.5)
4705.95228	-0.00498	21243.88594	0.041	9-7 R1e (1.5)	4823.96074	-0.00012	20575.67176	0.053	7-5 P1f (11.5)
4705.98974	0.00724	21243.71684	0.054	9-7 R1f (1.5)	4824.35463	-0.00113	20722.50475	0.437	8-6 P1e (5.5)
4709.78039	0.01302	21226.61889	0.114	9-7 R2e (1.5)	4830.22015	0.00130	20667.38921	0.298	8-6 P2e (4.5)
4715.94133	-0.38724	21198.98827	0.009	6-4 P1f (18.5)	4837.22015	0.08410	20667.38921	0.298	8-6 P2f (4.5)
4718.22761	-0.21786	21188.61605	0.004	6-4 P1e (18.5)	4851.30943	-0.17285	20577.67474	0.007	6-4 P1f (16.5)
4720.56910	-0.15689	21177.56360	0.010	6-4 P2f (17.5)	4858.78237	-0.00942	20570.58997	0.041	8-6 P1e (4.5)
4722.16210	0.00250	21170.96176	0.120	9-7 R1e (2.5)	4864.72657	0.00250	20550.53037	0.049	7-5 P2e (10.5)
4722.24049	-0.00011	21170.61032	0.130	9-7 R1f (2.5)	4865.46852	-0.00337	20547.39656	0.041	7-5 P2f (10.5)
4726.72337	-0.00007	21150.53185	0.090	9-7 R2f (2.5)	4878.19852	-0.0255	20493.77665	0.566	8-6 P2f (3.5)
4726.80642	0.00203	21150.16023	0.084	9-7 R2e (2.5)	4878.19852	-0.00061	20493.77665	0.566	8-6 P2e (3.5)

TABLE 30—Continued

Wavenumber (cm ⁻¹)	O-C (cm ⁻¹)	Wavelength (Angstroms)	Rel Int	Identification	Wavenumber (cm ⁻¹)	O-C (cm ⁻¹)	Wavelength (Angstroms)	Rel Int	Identification
4898.82545	0.00075	20407.48576	0.415	8-6 P1f(.3.5)	5060.23541	0.00191	19756.53305	0.018	6-4 P2e(12.5)
4899.00561	0.00055	20406.73528	0.413	8-6 P1e(.3.5)	5061.25571	0.00066	19752.55032	0.020	6-4 P2f(12.5)
4914.48721	-0.00522	20342.50010	0.082	7-5 P1f(10.5)	5062.90342	0.00691	19746.12190	0.280	8-6 R2e(1.5)
4915.54599	-0.00094	20338.06836	0.088	7-5 P1e(10.5)	5062.90342	-0.00774	19746.12190	0.280	8-6 R2f(1.5)
4917.90085	-0.00146	20328.32978	0.001	8-6 Q1e(.7.5)	5066.49154	0.00200	19732.13756	0.329	7-5 P1f(7.5)
4920.69152	-0.00050	20316.80098	0.001	8-6 Q1f(.7.5)	5067.15152	0.00077	19736.55350	0.313	7-5 P1e(7.5)
4921.12571	0.00078	20315.00843	0.064	7-5 P2e(.9.5)	5075.55676	0.00090	19656.99487	0.276	8-6 R1e(2.5)
4921.5250	-0.00302	20312.412129	0.066	7-5 P2f(.9.5)	5075.65080	0.00173	19656.52993	0.274	8-6 R1f(2.5)
4926.27369	-0.11041	20293.77913	0.013	6-4 P1f(15.5)	5076.26975	-0.00282	19694.12833	0.246	7-5 P2e(6.5)
4928.08219	-0.04584	20286.53174	0.019	6-4 P1e(15.5)	5076.57123	-0.00008	19692.95876	0.221	7-5 P2f(6.5)
4930.17175	-0.03482	20277.73376	0.009	6-4 P2e(14.5)	5081.78321	-0.00067	19672.76125	0.156	8-6 R2f(2.5)
4931.44259	-0.02002	20272.58155	0.009	6-4 P2f(14.5)	5081.85561	-0.00141	19672.48097	0.171	8-6 R2e(2.5)
4931.92960	0.00168	20270.50632	0.270	8-6 P1f(2.5)	5090.94976	-0.00034	19637.33927	0.261	8-6 R1e(3.5)
4932.02447	0.00097	20270.11640	0.269	8-6 P1e(2.5)	5091.06783	0.00118	19636.88385	0.272	8-6 R1f(3.5)
4938.42965	0.00007	20243.82589	0.002	8-6 Q1e(.6.5)	5094.40341	-0.04238	19624.02652	0.008	5-3 P1f(17.5)
4940.47802	0.00005	20235.53260	0.002	8-6 Q1f(.6.5)	5096.54933	-0.06517	19615.76374	0.009	5-3 P1e(17.5)
4952.10297	0.00156	20187.93034	0.149	8-6 P2f(1.5)	5097.11329	-0.00078	19613.59339	0.141	8-6 R2f(3.5)
4952.20463	0.00146	20187.51592	0.146	8-6 P2e(1.5)	5097.23188	-0.00003	19613.20707	0.160	8-6 R2e(3.5)
4956.03386	-0.00270	20171.91822	0.003	8-6 Q1e(.5.5)	5097.57509	-0.04448	19611.81656	0.009	5-3 P2e(16.5)
4957.44067	0.00077	20166.19388	0.003	8-6 Q1f(.5.5)	5099.13347	-0.0305	19605.82285	0.006	5-3 P2f(16.5)
4967.70768	-0.00063	20124.51537	0.128	7-5 P1f(9.5)	5103.68853	-0.00104	19588.32457	0.213	8-6 R1e(4.5)
4968.63254	0.00018	20120.76940	0.130	7-5 P1e(9.5)	5103.81760	0.00054	19587.82921	0.209	8-6 R1f(4.5)
4970.72208	-0.00189	20112.27077	0.006	8-6 Q1e(4.5)	5108.94703	-0.00055	19568.16283	0.115	8-6 R2f(4.5)
4971.61588	0.00106	20108.69543	0.006	8-6 Q1f(4.5)	5109.10106	-0.00071	19567.57288	0.123	8-6 R2e(4.5)
4974.21381	0.00008	20098.19306	0.001	8-6 Q2e(3.5)	5111.93150	0.00208	19556.87345	0.419	7-5 P1f(6.5)
4974.52843	0.00350	20096.92192	0.001	8-6 Q2f(3.5)	5112.46996	0.00096	19554.67686	0.421	7-5 P1e(6.5)
4975.19164	-0.00130	20094.24293	0.098	7-5 P2e(8.5)	5113.62600	-0.00062	19550.25794	0.148	8-6 R1e(5.5)
4975.70656	-0.00266	20092.16344	0.097	7-5 P2f(8.5)	5113.75258	-0.00029	19549.77401	0.159	8-6 R2f(5.5)
4982.56227	-0.00074	20064.19363	0.011	8-6 Q1e(3.5)	5116.87160	-0.0160	19536.873563	0.035	6-4 P1f(10.5)
4983.05173	0.00155	20062.54696	0.011	8-6 Q1f(3.5)	5117.25128	0.10394	19536.40769	0.018	8-6 R1e(10.5)
4985.44968	-0.00116	20052.89707	0.002	8-6 Q2e(2.5)	5117.33815	-0.00161	19536.07604	0.067	8-6 R2f(5.5)
4985.83873	0.00265	20051.33232	0.002	8-6 Q2f(2.5)	5117.51068	0.00005	19535.41741	0.068	8-6 R2e(5.5)
4991.81454	0.00079	20027.32842	0.020	8-6 Q1e(2.5)	5118.24242	-0.00460	19524.62449	0.034	6-4 P1e(12.5)
4992.04433	-0.06372	20026.40653	0.014	6-4 P1f(14.5)	5120.63523	-0.00155	19523.49712	0.092	8-6 R1f(6.5)
4993.62764	-0.00081	20020.56684	0.003	8-6 Q2e(1.5)	5120.74162	0.00043	19523.09150	0.094	8-6 R1f(6.5)
4993.97155	0.00188	20018.67815	0.003	8-6 Q2f(1.5)	5122.31365	-0.02007	19517.53266	0.013	8-6 R2e(8.5)
4996.28441	-0.00923	20009.41118	0.019	6-4 P2e(13.5)	5122.49404	0.00010	19516.41259	0.043	8-6 R2e(6.5)
4997.92965	0.00212	20002.82439	0.039	8-6 Q1e(1.5)	5122.89298	0.00255	19514.89276	0.023	6-4 P2f(11.5)
4997.98637	0.00176	20002.99739	0.039	8-6 Q1f(1.5)	5123.03002	0.01386	19508.38970	0.03	8-6 R1e(9.5)
4998.64604	-0.00010	19999.95765	0.007	8-6 Q2e(0.5)	5123.26218	0.20200	19513.48645	0.261	7-5 P1f(5.5)
4998.84113	0.00143	19999.15710	0.008	8-6 Q2f(0.5)	5123.26218	-0.00237	19513.48645	0.261	7-5 P1e(5.5)
5018.39565	0.00113	19921.24889	0.191	7-5 P1f(8.5)	5123.88560	0.00131	19511.11226	0.025	8-6 R2f(7.5)
5019.18796	-0.00049	19918.10420	0.195	7-5 P1e(8.5)	5124.05999	-0.00005	19516.41259	0.043	8-6 R2e(6.5)
5021.47155	-0.08045	19909.04613	0.010	5-3 P1f(18.5)	5124.60068	0.00087	19508.38970	0.053	8-6 R1e(7.5)
5023.75771	-0.08197	19899.99404	0.009	5-3 P1e(18.5)	5124.67958	-0.0264	19508.08935	0.052	8-6 R1f(7.5)
5024.42046	-0.07019	19897.36120	0.006	5-3 P2e(17.5)	5125.44919	-0.01592	19505.16011	0.042	8-6 R2e(8.5)
5026.12865	-0.05631	19890.59883	0.011	5-3 P2f(17.5)	5125.64723	0.00137	19504.67478	0.042	8-6 R2f(7.5)
5026.90888	-0.00254	19887.50764	0.139	7-5 P2e(7.5)	5125.06477	0.00057	19503.10389	0.495	7-5 P1e(5.5)
5027.31331	-0.00159	19885.89985	0.142	7-5 P2f(7.5)	5125.31467	-0.02932	19504.62075	0.011	8-6 R1e(6.5)
5040.36773	0.00012	19834.39982	0.115	8-6 R2e(0.5)	5167.28381	-0.02976	19347.24511	0.012	5-3 P1e(16.5)
5040.41086	0.00243	19834.23797	0.118	8-6 R2f(0.5)	5167.87416	-0.00127	19345.0399	0.335	7-5 P2e(4.5)
5055.59613	-0.03916	19774.662270	0.025	6-4 P1f(13.5)	5167.97903	0.00299	19344.64243	0.334	7-5 P2f(4.5)
5057.10570	-0.01104	19768.75986	0.031	6-4 P1e(13.5)	5168.72120	-0.02237	19341.86476	0.008	5-3 P1e(15.5)
5057.66337	-0.00310	19766.57229	0.138	8-6 R1e(1.5)	5170.16122	-0.01977	19336.47756	0.009	5-3 P2f(15.5)
5057.72560	-0.00294	19766.33690	0.226	8-6 R1f(1.5)	5175.84312	-0.00812	19315.25048	0.043	6-4 P1f(11.5)

TABLE 30—Continued

Wavenumber (cm ⁻¹)	O-C (cm ⁻¹)	Wavelength (Angstroms)	Rel Int	Identification	Wavenumber (cm ⁻¹)	O-C (cm ⁻¹)	Wavelength (Angstroms)	Rel Int	Identification
5177.06898	-0.00063	19310.67689	0.047	6-4 P1e(11.5)	5235.96834	0.00368	18735.62535	0.008	7-5 Q2f(0.5)
5181.53736	0.00600	19294.02401	0.035	6-4 P2e(10.5)	5238.35838	0.00170	18727.23721	0.206	6-4 P1f(8.5)
5182.31604	0.00207	19291.12494	0.040	6-4 P2f(10.5)	5239.17883	0.00079	18724.35946	0.201	6-4 P1e(8.5)
5194.57058	0.00043	19245.61510	0.530	7-5 P1f(4.5)	5346.63263	0.00029	18698.25560	0.151	6-4 P2e(7.5)
5194.72555	0.00018	19244.19638	0.526	7-5 P1e(4.5)	5247.07214	-0.00176	18656.71867	0.150	6-4 P2f(7.5)
5210.08520	0.01303	19188.30536	0.500	7-5 P2f(3.5)	5365.40509	0.00184	18632.83416	0.020	5-3 P1f(13.5)
5210.08520	-0.00873	19188.30536	0.500	7-5 P2e(3.5)	5266.94158	-0.00549	18627.49980	0.020	5-3 P1e(13.5)
5231.64672	-0.00053	19109.22330	0.453	7-5 P1f(3.5)	5369.83449	-0.00598	18617.46453	0.016	5-3 P2e(12.5)
5231.84027	-0.00069	19108.56931	0.480	7-5 P1e(3.5)	5370.88975	-0.00075	18613.80661	0.015	5-3 P2f(12.5)
5232.45086	-0.00280	19106.28653	0.074	6-4 P1f(10.5)	5379.97960	0.00140	18582.35726	0.052	7-5 R2e(0.5)
5233.53754	0.00102	19102.31934	0.075	6-4 P1e(10.5)	5380.0772	0.0061	18581.19106	0.263	7-5 R2f(0.5)
5234.13602	-0.00777	19100.13515	0.014	5-3 P1f(15.5)	5387.53383	0.00174	18556.30164	0.263	6-4 P1f(7.5)
5235.96723	-0.02037	19093.45513	0.012	5-3 P1e(15.5)	5388.22477	0.00084	18553.92214	0.264	6-4 P1e(7.5)
5237.84027	-0.01415	19086.62734	0.007	5-3 P2e(14.5)	5396.72513	0.09441	18554.69790	0.018	4-2 P1f(17.5)
5238.83888	0.00392	19082.99130	0.055	6-4 P2e(9.5)	5397.09835	-0.00152	18523.41688	0.178	6-4 P2e(6.5)
5239.14024	-0.00426	19081.89144	0.011	5-3 P2f(14.5)	5397.42916	-0.00164	18552.28158	0.180	6-4 P2f(6.5)
5239.50077	0.00047	19080.57841	0.057	6-4 P2f(9.5)	5397.76558	-0.00078	18521.12716	0.146	7-5 R1e(1.5)
5249.80953	-0.01119	19045.30842	0.016	4-2 P1e(19.5)	5397.83690	-0.00223	18520.88245	0.154	7-5 R1f(1.5)
5249.80953	-0.00848	19043.11091	0.220	7-5 P2e(2.5)	5398.88748	-0.00091	18517.27843	0.014	4-2 P1e(17.5)
5256.75789	0.00092	19017.93978	0.001	7-5 Q1e	5404.23439	0.00340	18488.95755	0.290	7-5 R2e(1.5)
5259.84172	0.00521	19006.78961	0.001	7-5 Q1f	5404.23439	-0.00051	18488.95755	0.290	7-5 R2f(1.5)
5265.85556	-0.00146	18985.07939	0.300	7-5 P1f(2.5)	5417.18505	-0.00070	18447.73275	0.244	7-5 R1e(2.5)
5265.96015	-0.00146	18984.70052	0.300	7-5 P1e(19.5)	5417.29463	0.00084	18454.35945	0.241	7-5 R1f(2.5)
5276.80170	-0.00061	18945.70051	0.002	7-5 Q1e	5424.85721	0.00380	18428.63293	0.132	7-5 R2f(2.5)
5279.06738	0.00334	18937.56936	0.001	7-5 Q1f	5424.92710	-0.00231	18448.39551	0.131	7-5 R2e(2.5)
5286.64206	0.00048	18910.43566	0.109	6-4 P1f	5427.75027	0.00165	18418.81024	0.026	5-3 P1f(12.5)
5286.80066	0.00461	18909.86836	0.139	6-4 P2f	5429.14298	-0.00211	18414.08534	0.024	5-3 P1e(11.5)
5286.90407	0.00290	18909.49449	0.151	7-5 P2e	5432.64742	0.00202	18402.20695	0.020	5-3 P2e(11.5)
5287.59472	0.00060	18907.02858	0.156	6-4 P1e	5433.58031	0.00220	18399.04748	0.023	5-3 P2f(11.5)
5293.87554	0.00196	18884.59667	0.093	6-4 P2e	5442.95356	0.00146	18370.30359	0.351	6-4 P1f(6.5)
5293.98740	0.00132	18884.19765	0.003	7-5 Q1e	5434.20542	0.00038	18396.90999	0.232	7-5 R1e(3.5)
5294.42507	-0.00078	18882.63656	0.091	6-4 P2f	5434.34788	0.00088	18336.44872	0.201	7-5 R1f(3.5)
5295.55335	0.00183	18878.61339	0.003	7-5 Q1f	5434.66002	0.00075	18336.39211	0.336	6-4 P1e(6.5)
5297.92277	-0.00261	18890.15060	0.001	7-5 Q2e	5441.97054	0.00154	18370.68048	0.126	7-5 R2f(3.5)
5298.04287	-0.00022	18869.71243	0.001	7-5 Q2f	5442.80933	0.00220	18370.27948	0.023	7-5 R2e(3.5)
5300.85155	-0.00160	18859.74420	0.016	5-3 P1f	5445.26413	-0.00233	18359.56889	0.234	6-4 P2e(5.5)
5302.55333	-0.01212	18880.74898	0.016	5-3 P1e	5445.74823	-0.00091	18308.80996	0.174	7-5 R1e(4.5)
5304.88174	-0.00007	18845.41619	0.010	5-3 P2e	5448.66787	0.00139	18348.09980	0.174	7-5 R1f(4.5)
5306.06236	0.00027	18841.22301	0.014	5-3 P2f	5448.82945	0.00133	18347.55570	0.178	7-5 R1f(4.5)
5308.34129	-0.00035	18833.13425	0.006	7-5 Q1e	5455.64376	0.00141	18324.63887	0.091	7-5 R2f(4.5)
5309.32289	0.00125	18829.63460	0.006	7-5 Q1f	5455.80263	-0.00371	18308.50227	0.093	7-5 R2e(4.5)
5311.80020	0.00212	18820.87058	0.002	7-5 Q2e	5460.42126	0.00143	18308.60604	0.125	7-5 R1e(5.5)
5312.14315	0.00023	18819.65551	0.001	7-5 Q2f	5460.58716	0.00136	18308.04980	0.124	7-5 R1f(5.5)
5319.89262	-0.00028	18792.24096	0.011	7-5 Q1e	5465.94671	0.00062	18290.09810	0.070	7-5 R2f(5.5)
5320.43115	0.00072	18790.32469	0.011	7-5 Q1f	5466.12977	-0.00059	18299.48570	0.066	7-5 R2f(6.5)
5322.69738	0.16015	18782.31850	0.010	4-2 P1f	5468.77439	0.05405	18280.64103	0.009	4-2 P1f(16.5)
5322.79408	0.00002	18781.99728	0.002	7-5 Q2e	5469.33467	0.00132	18278.76836	0.083	7-5 R1e(6.5)
5323.21714	0.00355	18780.50459	0.002	7-5 Q2f	5469.49201	0.00112	18278.24253	0.079	7-5 R1f(6.5)
5325.01271	-0.00657	18774.17188	0.009	4-2 P1e	5470.78925	0.00189	18273.90337	0.070	7-5 R2f(6.5)
5328.70218	-0.00107	18761.17307	0.020	7-5 Q1e	5472.92261	-0.00059	18266.78514	0.039	7-5 R2f(6.5)
5328.93662	-0.00042	18760.34065	0.020	7-5 Q1f	5473.11747	-0.00296	18266.13479	0.042	7-5 R2e(6.5)
5330.81237	0.00188	18753.71649	0.003	7-5 Q2e	5473.49235	0.00815	18264.88374	0.006	4-2 P2f(15.5)
5331.18992	0.00325	18752.41837	0.003	7-5 Q2f	5474.14959	0.51717	18262.69081	0.009	7-5 R1f(10.5)
5334.85688	-0.00173	18739.52872	0.039	7-5 Q1e	5475.30113	0.00040	18258.84988	0.050	7-5 R1e(7.5)
5334.92012	-0.00134	18739.30658	0.039	7-5 Q1f	5475.43406	0.00047	18258.40660	0.046	7-5 R1f(7.5)
5335.74483	0.00388	18736.40315	0.008	7-5 Q2e	5476.59166	0.35870	18254.54728	0.033	7-5 R2f(8.5)

TABLE 30—Continued

Wavenumber (cm ⁻¹)	O-C (cm ⁻¹)	Wavelength (Angstroms)	Rel Int	Identification	Wavenumber (cm ⁻¹)	O-C (cm ⁻¹)	Wavelength (Angstroms)	Rel Int	Identification
5476.78399	0.35004	18253.90622	0.026	7-5 R2e(8.5)	5658.59754	-0.00038	17667.39860	0.021	6-4 Q1e(-2.5)
5477.96439	0.00096	18249.97284	0.427	6-4 P1f(5.5)	5658.86077	0.00035	17666.57677	0.020	6-4 Q1f(-2.5)
5478.22899	0.00091	17449.09136	0.064	7-5 R1e(8.5)	5660.74403	0.00131	17660.69931	0.003	6-4 Q2e(1.5)
5478.40600	0.00051	18248.50172	0.412	6-4 P1e(5.5)	5661.15115	0.00312	17659.42295	0.003	6-4 Q2e(1.5)
5487.83223	0.00168	18217.15697	0.043	5-3 P1f(11.5)	5661.97176	-0.00086	17656.6980	0.149	5-3 P2e(7.5)
5489.08625	-0.00101	18212.99513	0.452	5-3 P1e(11.5)	5662.43907	0.00018	17655.41261	0.150	5-3 P2f(7.5)
5491.12236	-0.00221	18206.24174	0.279	6-4 P2e(4.5)	5664.65745	-0.00246	17648.51015	0.040	6-4 Q1e(1.5)
5491.24552	0.00062	18205.83340	0.280	6-4 P2f(4.5)	5664.72425	-0.00026	17648.29032	0.040	6-4 Q1f(1.5)
5493.29695	0.00122	18199.03457	0.034	5-3 P2e(10.5)	5665.64693	0.00246	17645.41620	0.008	6-4 Q2e(0.5)
5494.11148	0.00008	18196.33647	0.036	5-3 P2f(10.5)	5665.88610	0.00337	17646.67134	0.008	6-4 Q2f(0.5)
5519.06052	0.00043	18114.07943	0.447	6-4 P1f(4.5)	5672.60392	-0.00043	17623.77550	0.013	4-2 P1f(13.5)
5519.38342	0.00014	18113.01970	0.446	6-4 P1e(4.5)	5674.17493	0.00246	17618.89600	0.019	4-2 P1e(13.5)
5534.65722	-0.00620	18063.03379	0.191	6-4 P2e(3.5)	5676.83590	0.00075	17610.63728	0.012	4-2 P2e(12.5)
5534.67476	0.00842	18062.97655	0.218	6-4 P2f(3.5)	5677.92867	0.00075	17607.24794	0.015	4-2 P2f(12.5)
5538.81296	0.01876	18049.48119	0.007	4-2 P1f(15.5)	5700.04838	0.00328	17658.92087	0.006	3-1 P1e(17.5)
5540.66905	0.00500	18043.33471	0.009	4-2 P1e(15.5)	5704.35315	-0.00088	17655.68518	0.306	5-3 P1f(7.5)
5543.67552	0.00096	18005.64931	0.011	4-2 P2f(14.5)	5705.07231	0.00242	17623.47795	0.308	5-3 P1e(7.5)
5545.59754	0.00020	18027.39912	0.072	5-3 P1f(10.5)	5713.70670	-0.00417	17613.99495	0.230	5-3 P2e(6.5)
5546.71399	-0.00018	18023.77053	0.073	5-3 P1e(10.5)	5714.06420	-0.00074	17695.90025	0.224	5-3 P2f(6.5)
5551.75032	0.00028	18007.42006	0.059	5-3 P2e(9.5)	5720.62958	0.00074	17445.3526	0.178	6-4 R1e(1.5)
5552.44731	-0.00049	17995.15962	0.058	5-3 P2f(9.5)	5730.71023	-0.00056	17405.07975	0.184	6-4 R1f(1.5)
5557.31452	-0.00055	17989.33901	0.408	6-4 P1f(3.5)	5736.26262	-0.00394	17428.19384	0.024	4-2 P1f(12.5)
5557.52508	0.00015	17988.70874	0.411	6-4 P1e(3.5)	5737.768971	0.00235	17423.85906	0.030	4-2 P1e(12.5)
5575.74313	0.00242	17929.93281	0.260	6-4 P2f(2.5)	5738.20439	0.00417	17422.29625	0.222	6-4 R2e(1.5)
5575.79252	0.00155	17929.77399	0.308	6-4 P2e(2.5)	5732.21505	-0.00352	17422.77070	0.133	6-4 R2f(1.5)
5587.58715	-0.00054	17891.92266	0.001	6-4 Q1e(7.5)	5740.95923	-0.00452	17413.93603	0.022	4-2 P2e(11.5)
5590.96085	-0.00093	17881.13029	0.001	6-4 Q1f(7.5)	5741.93127	-0.00481	17410.98806	0.022	4-2 P2f(11.5)
5592.69198	-0.00116	17875.59546	0.278	6-4 P1f(2.5)	5751.46048	-0.00012	17382.14093	0.230	6-4 R1e(2.5)
5592.80428	-0.00003	17874.36353	0.282	6-4 P1e(2.5)	5751.58536	-0.00191	17363.7352	0.234	6-4 R1f(2.5)
5600.98341	0.00010	17849.13325	0.123	5-3 P1f(9.5)	5752.18376	-0.00084	17379.95529	0.420	5-3 P1f(6.5)
5601.96484	0.00165	17846.00619	0.124	5-3 P1e(9.5)	5755.75532	0.00233	17378.16810	0.425	5-3 P1e(6.5)
5606.76815	0.00716	17830.71753	0.012	4-2 P1f(14.5)	5760.43825	0.00190	17355.05045	0.135	6-4 R2f(2.5)
5607.37158	-0.00055	17828.79870	0.001	6-4 Q1e(6.5)	5761.46010	-0.00161	17354.84001	0.133	6-4 R2f(3.5)
5607.98130	0.00014	17826.86029	0.092	5-3 P2e(8.5)	5763.18207	-0.00003	17346.78780	0.293	5-3 P2e(5.5)
5608.47489	0.01173	17825.29138	0.014	4-2 P1e(14.5)	5765.43096	-0.00088	17346.03869	0.297	5-3 P2f(5.5)
5608.56306	-0.00033	17825.01116	0.092	5-3 P2f(8.5)	5769.96616	0.00126	17316.39213	0.420	5-3 P1e(3.5)
5609.85633	0.00009	17820.90186	0.001	6-4 Q1f(6.5)	5770.13136	0.00109	17305.89607	0.221	6-4 R1f(3.5)
5610.61324	0.00801	17818.49769	0.009	4-2 P2e(13.5)	5779.16191	-0.00044	17288.822251	0.127	6-4 R2f(3.5)
5611.83134	0.00158	17814.63002	0.012	4-2 P2f(13.5)	5779.28447	-0.00070	17298.45565	0.128	6-4 R2e(3.5)
5614.40828	0.00263	17806.87714	0.154	6-4 P2f(1.5)	5785.97843	0.00106	17278.44257	0.184	6-4 R1e(4.5)
5624.34261	-0.00057	17775.01519	0.003	6-4 Q1e(5.5)	5786.16779	0.00155	17277.87711	0.188	6-4 R1f(4.5)
5624.77310	-0.01210	17773.64119	0.006	3-1 P1e(18.5)	5794.46773	-0.00114	17253.12841	0.088	6-4 R2e(4.5)
5626.06083	0.00483	17769.57303	0.003	6-4 Q1f(5.5)	5797.33075	-0.00096	17244.60792	0.092	6-4 R2e(5.5)
5628.24340	-0.00483	17762.68218	0.001	6-4 Q2e(4.5)	5797.68849	-0.00739	17243.54386	0.066	4-2 P1f(11.5)
5628.34786	-0.00005	17762.35252	0.001	6-4 Q2f(4.5)	5797.79624	0.00235	17243.22340	0.534	5-3 P1e(5.5)
5638.51357	-0.00056	17730.32863	0.006	6-4 Q1e(4.5)	5798.97220	0.00109	17239.72668	0.040	4-2 P1e(11.5)
5639.60192	0.00186	17726.1011	0.006	6-4 Q1f(4.5)	5799.33571	-0.00134	17238.64607	0.121	6-4 R1e(5.5)
5641.93659	-0.00280	17719.57145	0.001	6-4 Q2e(3.5)	5799.53652	0.00119	17238.04918	0.129	6-4 R1f(5.5)
5642.29097	0.00036	17718.45852	0.001	6-4 Q2f(3.5)	5800.94034	-0.00444	17227.93788	0.033	4-2 P2e(10.5)
5649.91340	-0.00018	17694.55411	0.011	6-4 Q1e(3.5)	5803.78890	-0.00249	17225.41901	0.035	4-2 P2f(10.5)
5650.51402	0.00133	17692.6737	0.011	6-4 Q1f(3.5)	5806.43831	-0.00183	17217.55925	0.061	6-4 R2f(5.5)
5652.79949	-0.00011	17685.51858	0.002	6-4 Q2e(2.5)	5806.63383	-0.00164	17216.97950	0.064	6-4 R2e(5.5)
5653.25381	0.00206	17684.09870	0.002	6-4 Q2f(2.5)	5809.76316	0.22366	17207.70586	0.007	6-4 R1e(12.5)
5653.92625	-0.00048	17681.99547	0.205	5-3 P1f(8.5)	5809.90643	0.00102	17207.28152	0.074	6-4 R1e(6.5)
5654.77548	0.00212	17679.34000	0.206	5-3 P1e(8.5)	5810.10513	0.00020	17206.69305	0.096	6-4 R1f(6.5)

TABLE 30—Continued

Wavenumber (cm ⁻¹)	O-C (cm ⁻¹)	Wavelength (Angstroms)	Rel Int	Identification	Wavenumber (cm ⁻¹)	O-C (cm ⁻¹)	Wavelength (Angstroms)	Rel Int	Identification
5810.39663	0.00000	17205.82981	0.331	5-3 P2e(4.5)	5979.63748	-0.00514	16718.85508	0.008	3-1 P1f(13.5)
5810.53867	-0.00024	17205.40921	0.333	5-3 P2f(4.5)	5981.24584	0.00387	16714.35937	0.011	3-1 P1e(13.5)
5815.12717	-0.00204	17191.83305	0.037	6-4 R2f(6.5)	5983.69582	-0.00648	16704.51579	0.009	3-1 P2e(12.5)
5815.33883	-0.00055	17191.20732	0.035	6-4 R2e(6.5)	5984.70695	-0.00667	16704.69301	0.026	5-3 Q1e(2.5)
5817.58156	0.00264	17184.57995	0.048	6-4 R1e(7.5)	5984.99722	0.00021	16703.88284	0.026	5-3 Q1f(2.5)
5817.76939	-0.00299	17184.02513	0.045	6-4 R1f(7.5)	5986.86074	0.00086	16698.68345	0.004	5-3 Q2e(1.5)
5817.85118	-0.01934	17183.78355	0.018	6-4 R1e(11.5)	5987.29369	0.00072	16697.47594	0.004	5-3 Q2f(1.5)
5820.56262	-0.00163	17175.77868	0.020	6-4 R2f(7.5)	5990.71831	-0.00039	16687.93074	0.053	5-3 Q1e(1.5)
5820.77746	0.00230	17175.14474	0.022	6-4 R2e(7.5)	5990.79723	-0.00043	16687.71091	0.053	5-3 Q1f(1.5)
5821.69377	-0.19842	17172.44144	0.008	6-4 R2e(9.5)	5991.76984	0.00053	16685.00208	0.010	5-3 Q2e(0.5)
5821.88401	-0.18934	17171.98030	0.010	6-4 R2f(9.5)	5992.02572	0.00045	16684.02577	0.011	5-3 Q2f(0.5)
5822.28126	0.00009	17170.70867	0.028	6-4 R1e(8.5)	6019.72376	0.00195	16607.52149	0.389	4-2 P1f(7.5)
5822.44585	-0.01029	17170.22329	0.027	6-4 R1f(8.5)	6020.47239	-0.00087	16605.45639	0.387	4-2 P1e(7.5)
5822.54170	-0.07905	17169.94064	0.013	6-4 R1e(10.5)	6028.87236	0.00063	16582.32014	0.284	4-2 P2e(6.5)
5822.75605	-0.00335	17169.30557	0.013	6-4 R1f(8.5)	6029.25437	0.00040	16581.26949	0.287	4-2 P2f(6.5)
5822.95968	0.00637	17168.70815	0.012	6-4 R2e(8.5)	6040.86754	0.00237	16549.39306	0.127	5-3 R2e(0.5)
5823.92951	-0.00170	17165.84913	0.010	6-4 R1e(9.5)	6040.93783	-0.00071	16549.20050	0.125	5-3 R2f(0.5)
5824.04809	-0.00588	17165.49963	0.028	6-4 R1f(9.5)	6044.81404	-0.00516	16554.58246	0.015	3-1 P1e(12.5)
5839.70106	-0.00058	17119.48848	0.583	5-3 P1f(4.5)	6046.27855	0.00287	16554.58246	0.015	3-1 P1e(12.5)
5840.04481	0.00138	17118.48081	0.583	5-3 P1e(4.5)	6049.32550	-0.00501	16536.25424	0.014	3-1 P2e(11.5)
5842.85336	-0.00088	17110.25227	0.010	3-1 P1f(15.5)	6050.33436	-0.00225	16523.49857	0.015	3-1 P2f(11.5)
5844.74157	-0.00921	17104.72460	0.011	3-1 P1e(15.5)	6058.30604	0.00157	16538.56311	0.380	5-3 R2e(1.5)
5847.59843	-0.00195	17096.36804	0.007	3-1 P2f(14.5)	6068.30604	-0.00074	16474.56311	0.380	5-3 R2f(1.5)
5855.34175	-0.00249	17073.77914	0.028	6-4 R1f(9.5)	6068.94632	0.00206	16472.82502	0.563	4-2 P1f(6.5)
5855.37762	0.00313	17073.65455	0.027	5-3 P2f(3.5)	6069.56492	-0.00098	16471.14614	0.568	4-2 P1e(6.5)
5856.81100	-0.00294	17069.47599	0.079	4-2 P1f(10.5)	6079.77234	0.00100	16434.49246	0.403	4-2 P2e(5.5)
5857.95985	0.00025	17066.12835	0.081	4-2 P1e(10.5)	6092.05097	-0.00060	16410.35029	0.159	5-3 R2f(0.5)
5862.74783	-0.00329	17052.13080	0.055	4-2 P2e(9.5)	6092.12314	-0.00092	16410.15588	0.177	5-3 R2e(2.5)
5863.47680	-0.00185	17050.07080	0.062	4-2 P2f(9.5)	6107.76263	-0.00394	16368.13611	0.030	3-1 P1f(11.5)
5879.21092	-0.00067	17004.44085	0.515	5-3 P1f(3.5)	6109.08491	0.00178	16364.59331	0.032	3-1 P1e(11.5)
5897.95888	0.00201	16950.38843	0.026	5-3 P2e(2.5)	6112.26128	-0.00154	16356.08908	0.149	5-3 R2f(3.5)
5912.28798	0.00492	16909.30720	0.009	3-1 P1f(14.5)	6112.38951	0.00165	16355.74595	0.142	5-3 R2e(3.5)
5913.57364	-0.00043	16909.30939	0.140	4-2 P1f(9.5)	6112.82631	-0.00567	16312.92017	0.460	4-2 P2e(4.5)
5914.04687	0.00634	16904.27822	0.009	3-1 P1e(14.5)	6113.71000	-0.00360	16352.21308	0.031	3-1 P2e(10.5)
5914.58733	-0.00014	16902.73354	0.142	4-2 P1e(9.5)	6115.47533	0.00163	16347.49296	0.698	4-2 P1f(5.5)
5917.22550	0.00887	16895.19752	0.005	3-1 P2f(13.5)	6115.96569	-0.00118	16346.18227	0.698	4-2 P1e(5.5)
5920.35210	-0.00158	16886.27498	0.113	4-2 P2f(8.5)	6119.40130	-0.00066	16295.00504	0.218	5-3 R1f(4.5)
5920.96412	-0.00145	16884.52953	0.001	5-3 Q2f(4.5)	6128.43615	0.00099	16248.60158	0.144	5-3 R1f(5.5)
5933.70142	-0.00069	16848.28512	0.002	5-3 Q1e(6.5)	6128.59601	0.00057	16275.55933	0.069	4-2 P2f(4.5)
5936.39726	0.00199	16840.63395	0.002	5-3 Q1f(6.5)	6129.04611	0.00022	16311.29671	0.125	5-3 R2f(4.5)
5950.50642	-0.00105	16800.02093	0.003	5-3 Q1e(5.5)	6129.22342	0.0043	16230.84285	0.119	5-3 R1e(6.5)
5952.47667	0.00245	16795.14234	0.003	5-3 Q1f(5.5)	6133.99432	0.00261	16298.13860	0.142	5-3 R1e(6.5)
5954.66946	-0.00159	16789.52149	0.001	5-3 Q2e(4.5)	6134.22770	-0.00072	16297.51853	0.144	5-3 R1f(5.5)
5954.55808	-0.00008	16789.27161	0.001	5-3 Q2f(4.5)	6142.50407	0.00003	16247.99090	0.059	5-3 R2f(5.5)
5964.72155	-0.00146	16760.66383	0.007	5-3 Q1e(4.5)	6142.71467	-0.00064	16241.94260	0.070	5-3 R1e(7.5)
5965.90499	0.00156	16757.32642	0.007	5-3 Q1f(4.5)	6146.04065	0.00380	16231.42173	0.807	4-2 P1f(4.5)
5967.90409	0.00104	16751.72576	0.249	4-2 P1f(8.5)	6146.27828	-0.00038	16230.46219	0.800	4-2 P1e(4.5)
5976.22761	-0.00054	16728.39441	0.177	4-2 P2f(7.5)	6159.66055	-0.00328	16230.22676	0.003	5-3 R2f(7.5)
5976.72975	0.00102	16726.38896	0.014	5-3 Q1f(3.5)	6159.90306	-0.00798	16229.58805	0.017	5-3 R2e(7.5)
5978.92598	0.00192	16720.84465	0.002	5-3 Q2e(2.5)	6161.44142	0.00499	16225.53592	0.029	5-3 R1e(8.5)
5979.40561	-0.00102	16719.50341	0.002	5-3 Q2f(2.5)	6161.78269	-0.00597	16224.63727	0.007	5-3 R1e(11.5)

TABLE 30—Continued

Wavenumber (cm ⁻¹)	O-C (cm ⁻¹)	Wavelength (Angstroms)	Rel Int	Identification	Wavenumber (cm ⁻¹)	O-C (cm ⁻¹)	Wavelength (Angstroms)	Rel Int	Identification
6161.86733	0.00800	16224.41440	0.007	5-3 R1f(11.5)	6337.31444	-0.00029	15627.28945	0.045	4-2 R2f(1.5)
6163.39960	0.00299	16220.38088	0.016	5-3 R2f(8.5)	6397.31444	-0.00113	15627.28945	0.045	4-2 R2e(1.5)
6163.63334	-0.00040	16219.55260	0.013	5-3 R2e(8.5)	6397.55263	0.00079	15623.70365	0.306	3-1 P2f(5.5)
6163.93729	-0.00526	16218.96595	0.007	5-3 R2f(9.5)	6419.99873	-0.00600	15572.07224	0.012	2-0 P1f(11.5)
6164.64766	0.00179	16217.09699	0.017	5-3 R1e(9.5)	6422.35805	-0.00313	15566.77583	0.014	2-0 P1e(11.5)
6168.41682	-0.00160	16207.18765	0.056	3-1 P1f(10.5)	6422.50312	0.00185	15566.00007	0.223	4-2 R2f(2.5)
6169.6093	-0.00049	16204.0706	0.062	3-1 P1e(10.5)	6422.57931	-0.00081	15566.81541	0.226	4-2 R2e(2.5)
6174.15309	-0.00205	16192.12989	0.062	3-1 P2e(9.5)	6424.88311	-0.00602	15560.23389	0.010	2-0 P2e(10.5)
6200.04203	-0.00008	16124.51784	0.716	4-2 P1f(3.5)	6425.79853	-0.00448	15550.01718	0.009	2-0 P2f(10.5)
6200.28532	-0.00162	16123.88514	0.718	4-2 P1e(3.5)	6432.36167	-0.00116	15542.14283	0.348	4-2 R1e(3.5)
6221.3890	0.00261	16069.21189	0.000	4-2 Q1f(8.5)	6424.61223	0.00290	15553.76882	0.644	3-1 P1f(5.5)
6226.70706	0.00121	16055.46669	0.116	3-1 P1f(9.5)	6435.12742	-0.00126	15535.46297	0.647	3-1 P1e(5.5)
6227.75453	-0.00120	16052.76626	0.117	3-1 P1e(9.5)	6444.11230	0.00078	15513.80220	0.178	4-2 R2f(3.5)
6233.27926	-0.00008	16038.53823	0.077	3-1 P2e(8.5)	6447.46019	0.00174	15500.74653	0.430	3-1 P2e(4.5)
6233.92152	-0.00190	16036.88583	0.090	3-1 P2f(8.5)	6447.63587	0.00081	15505.3204	0.430	3-1 P2f(4.5)
6237.91553	-0.00149	16026.62029	0.461	4-2 P1f(2.5)	6451.13172	-0.00065	15496.92174	0.260	4-2 R1e(4.5)
6238.04690	-0.00120	16026.28021	0.465	4-2 P1e(2.5)	6451.37389	0.00119	15496.34002	0.260	4-2 R1f(4.5)
6238.86690	0.00423	16024.17381	0.001	4-2 Q1e(7.5)	6462.26786	0.00187	15470.21655	0.136	4-2 R2f(4.5)
6242.79185	0.00052	16014.09912	0.001	4-2 Q1f(7.5)	6462.45769	0.00143	15469.76212	0.132	4-2 R2e(4.5)
6258.62211	0.00255	15973.58012	0.002	4-2 Q1e(6.5)	6467.28361	-0.00038	15458.21849	0.176	4-2 R1e(5.5)
6260.66808	-0.00079	15968.37364	0.272	4-2 P2f(1.5)	6467.54792	0.00156	15457.58676	0.178	4-2 R1f(5.5)
6260.77896	-0.00091	15968.09084	0.269	4-2 P2e(1.5)	6477.08127	0.00058	15454.83534	0.077	4-2 R2f(5.5)
6261.52943	0.00052	15966.17700	0.002	4-2 Q1f(6.5)	6477.30763	0.00109	15454.29595	0.077	4-2 R2e(5.5)
6275.58116	0.00131	15930.42435	0.004	4-2 Q1e(5.5)	6479.78245	0.00181	15428.40113	0.713	3-1 P1f(4.5)
6277.60553	-0.00058	15925.29733	0.004	4-2 Q1f(5.5)	6480.16754	-0.00077	15427.48428	0.705	3-1 P1e(4.5)
6279.41115	0.00008	15920.71300	0.001	4-2 Q2e(4.5)	6480.67623	-0.00087	15426.27332	0.096	4-2 R1e(6.5)
6279.47773	0.00361	15920.53912	0.001	4-2 Q2f(4.5)	6480.94932	0.00119	15425.62330	0.109	4-2 R1f(6.5)
6282.55592	0.00250	15912.73112	0.204	3-1 P1f(8.5)	6492.31924	-0.00207	15422.36337	0.029	2-0 P1f(10.5)
6283.47216	-0.00191	15910.42089	0.207	3-1 P1e(8.5)	6493.53832	-0.00036	15409.17014	0.022	2-0 P1e(10.5)
6289.73687	0.00078	15914.57376	0.009	4-2 Q1e(4.5)	6487.86935	-0.00222	15409.01919	0.019	2-0 P1e(9.5)
6290.17227	0.00078	15896.45586	0.156	3-1 P2e(7.5)	6488.61189	0.00196	15407.39009	0.030	4-2 R2f(6.5)
6290.70241	-0.00115	15892.13162	0.147	3-1 P2f(7.5)	6488.87146	0.00080	15406.79042	0.046	4-2 R2e(6.5)
6291.02009	-0.00053	15891.31900	0.009	4-2 Q1f(4.5)	6491.19932	-0.00361	15401.62526	0.055	4-2 R1e(7.5)
6293.06646	0.00142	15886.16411	0.002	4-2 Q2e(3.5)	6491.49958	0.00140	15400.62406	0.055	4-2 R1f(8.5)
6293.43397	0.00062	15885.22885	0.002	4-2 Q2f(3.5)	6495.44211	0.00005	15331.20522	0.450	3-1 P2e(3.5)
6301.11463	-0.00075	15865.87330	0.018	4-2 Q1e(3.5)	6495.50791	-0.00135	15391.04931	0.426	3-1 P2f(3.5)
6301.83175	-0.00094	15864.06783	0.018	4-2 Q1f(3.5)	6496.92735	-0.00057	15379.68669	0.022	4-2 R2f(7.5)
6303.93134	0.00094	15858.78413	0.003	4-2 Q2e(2.5)	6497.19550	-0.00361	15370.54660	0.020	4-2 R2e(7.5)
6304.43228	-0.00059	15857.52905	0.003	4-2 Q2f(2.5)	6499.02946	-0.00048	15382.70954	0.026	4-2 R1f(10.5)
6309.76559	-0.00100	15844.12801	0.035	4-2 Q1e(2.5)	6502.02517	-0.00274	15315.62218	0.012	4-2 R2f(8.5)
6310.08111	-0.00124	15824.33074	0.035	4-2 Q2f(2.5)	6502.28958	-0.00068	15327.90917	0.019	4-2 R2e(8.5)
6311.90577	-0.00034	15838.74820	0.005	4-2 Q2e(0.5)	6503.55995	0.00076	15371.99367	0.012	4-2 R1f(9.5)
6312.36591	-0.00088	15837.60116	0.005	4-2 Q2f(1.5)	6504.17223	-0.00501	15370.54660	0.006	4-2 R2e(9.5)
6315.77777	-0.00135	15829.05300	0.072	4-2 Q1e(1.5)	6505.01277	0.00251	15368.56050	0.0006	4-2 R1f(10.5)
6315.85553	-0.00175	15828.83556	0.072	4-2 Q1f(1.5)	6522.00551	0.00086	15288.51848	0.718	3-1 P1f(3.5)
6316.85131	-0.00124	15826.34784	0.014	4-2 Q2e(0.5)	6522.26477	-0.00068	15266.16863	0.035	2-0 P2e(8.5)
6317.12227	-0.00177	15825.66649	0.014	4-2 Q2f(0.5)	6541.15199	-0.00187	15283.65061	0.419	3-1 P2f(2.5)
6335.89152	0.00352	15778.72746	0.336	3-1 P1f(7.5)	6541.18331	-0.00216	15283.56575	0.388	3-1 P2e(2.5)
6336.67011	-0.00166	15776.84871	0.339	3-1 P1e(7.5)	6542.26294	0.00110	15281.05527	0.049	2-0 P1f(9.5)
6344.84135	0.00199	15756.53038	0.240	3-1 P2e(6.5)	6543.34643	0.00008	15278.52493	0.048	2-0 P1e(9.5)
6345.24785	-0.00030	15755.52096	0.242	3-1 P2f(6.5)	6548.64255	-0.00030	15266.16863	0.035	2-0 P2e(8.5)
6347.75794	-0.00837	15717.10261	0.005	2-0 P2f(11.5)	6549.31396	-0.00197	15247.60360	0.036	2-0 P2f(8.5)
6368.36033	-0.00068	15698.33990	0.178	4-2 R2e(0.5)	6561.19763	-0.00015	15236.95624	0.470	3-1 P1f(2.5)
6368.43376	-0.00171	15698.19396	0.175	4-2 R2f(0.5)	6561.34108	-0.00066	15236.62312	0.438	3-1 P1e(2.5)
6386.61047	0.00343	15653.48085	0.489	3-1 P1f(6.5)	6564.52431	-0.00327	15229.23466	0.001	3-1 Q1e(7.5)
6387.25571	-0.00149	15651.89709	0.493	3-1 P1e(6.5)	6568.71456	0.00087	15219.51976	0.001	3-1 Q1f(7.5)

TABLE 30—Continued

Wavenumber (cm ⁻¹)	O-C (cm ⁻¹)	Wavelength (Angstroms)	Rel Int	Identification	Wavenumber (cm ⁻¹)	O-C (cm ⁻¹)	Wavelength (Angstroms)	Rel Int	Identification
6584.46095	0.00072	15183.12304	0.250	3-1 P2f(1.5)	6769.48313	0.00028	14768.14034	0.201	2-0 P2f(4.5)
6584.57605	-0.00090	15182.85763	0.245	3-1 P2e	6777.01781	0.00069	14751.72112	0.165	3-1 R2f(3.5)
6587.54931	-0.00210	15176.00491	0.002	3-1 Q1f(6.5)	6777.16627	0.00148	14751.39797	0.166	3-1 R2e(3.5)
6599.75388	0.00064	15147.94070	0.085	2-0 P1f(8.5)	6784.12097	-0.00239	14736.27564	0.219	3-1 R1e(4.5)
6600.69872	0.00085	15145.77239	0.086	2-0 P1e(8.5)	6784.38709	0.00210	14735.9760	0.225	3-1 R1f(4.5)
6601.53734	-0.00070	15143.84835	0.004	3-1 Q1e(5.5)	6796.46517	0.00116	14709.51058	0.105	3-1 R2f(4.5)
6603.70574	0.00168	15138.87570	0.004	3-1 Q1f(5.5)	6796.66894	0.00212	14709.06958	0.103	3-1 R2e(4.5)
6607.17745	-0.00007	15130.92104	0.065	2-0 P2e(7.5)	6801.53725	-0.00210	14698.54131	0.140	3-1 R1e(5.5)
6607.72690	-0.00112	15129.66286	0.065	2-0 P2f(7.5)	6801.82977	0.00307	14697.90918	0.141	3-1 R1f(5.5)
6610.22343	0.00054	15123.94948	0.001	9-6 P1e(12.5)	6803.24068	0.00069	14694.86101	0.319	2-0 P1f(4.5)
6611.94493	-0.000731	15120.00072	0.001	9-6 P1e(12.5)	6803.64724	0.00025	14693.92020	0.317	2-0 P1e(4.5)
6615.80870	-0.00077	15111.18060	0.007	3-1 Q1e(4.5)	6812.53673	0.00120	14674.80910	0.058	3-1 R2f(5.5)
6617.19484	0.00223	15108.01518	0.008	3-1 Q1f(4.5)	6812.78162	0.00239	14674.28160	0.060	3-1 R2e(5.5)
6617.48894	-0.00891	15107.34373	0.001	9-6 P2e(11.5)	6816.17667	-0.00144	14666.96783	0.075	3-1 R1e(6.5)
6618.46050	0.00221	15105.12604	0.001	9-6 P2f(11.5)	6816.48495	0.00365	14666.30920	0.077	3-1 R1f(6.5)
6619.09430	0.00091	15103.67967	0.001	3-1 Q2e(3.5)	6818.88632	0.00161	14661.14424	0.187	2-0 P2e(3.5)
6627.27475	-0.00086	15085.03625	0.016	3-1 Q1e(3.5)	6818.96225	-0.00064	14660.98098	0.192	2-0 P2f(3.5)
6628.05112	0.00015	15083.26973	0.016	3-1 Q1f(3.5)	6822.17038	0.00004	14654.08664	0.004	9-6 P1f(9.5)
6630.05190	-0.00107	15078.71753	0.003	3-1 Q2e(2.5)	6823.28536	-0.00006	14651.69204	0.004	9-6 P1e(9.5)
6630.56545	0.00040	15077.54965	0.003	3-1 Q2f(2.5)	6825.31122	0.00118	14647.34318	0.029	3-1 R2f(6.5)
6635.98260	-0.00094	15065.24138	0.031	3-1 Q1e(2.5)	6825.58490	0.00156	14646.75587	0.032	3-1 R2e(6.5)
6636.32790	-0.00049	15064.45751	0.031	3-1 Q1f(2.5)	6825.93551	-0.00022	14641.71352	0.037	3-1 R1e(7.5)
6638.10482	-0.00044	15060.42498	0.005	3-1 Q2e(1.5)	6828.24481	0.00236	14641.05029	0.037	3-1 R1f(7.5)
6638.58430	-0.00084	15059.33722	0.005	3-1 Q2f(1.5)	6831.69438	-0.00168	14633.65748	0.003	9-6 P2e(8.5)
6642.02283	-0.00105	15051.54109	0.065	3-1 Q1e(1.5)	6832.21627	-0.00111	14632.21620	0.003	9-6 P1e(8.5)
6642.11728	-0.00091	15051.32706	0.065	3-1 Q1f(1.5)	6834.83796	-0.00237	14626.92695	0.018	3-1 R2f(7.5)
6643.11161	-0.00146	15049.07420	0.013	3-1 Q2e(0.5)	6833.12554	-0.00038	14626.31153	0.015	3-1 R2e(7.5)
6643.39849	-0.00156	15048.42434	0.013	3-1 Q2f(0.5)	6837.02479	0.00174	14622.24850	0.016	3-1 R1f(8.5)
6654.70123	0.00071	15021.86516	0.145	2-0 P1f(7.5)	6841.12725	0.00292	14613.47988	0.008	3-1 R2f(8.5)
6655.51014	0.00081	15021.03928	0.144	2-0 P1e(7.5)	6841.42825	-0.00494	14612.83620	0.001	3-1 R2e(8.5)
6663.45903	0.00079	15003.12055	0.104	2-0 P2e(6.5)	6842.76386	-0.00007	14619.98471	0.00137	3-1 R1f(9.5)
6663.88845	-0.00050	15002.15375	0.105	2-0 P2f(6.5)	6844.20207	0.00196	14606.91463	0.009	3-1 R2f(9.5)
6685.05565	-0.00034	14954.65167	0.002	9-6 P1f(11.5)	6846.91064	0.00017	14601.73027	0.302	2-0 P1f(3.5)
6686.56523	-0.00933	14951.27546	0.002	9-6 P1e(11.5)	6847.18629	-0.00016	14600.54846	0.307	2-0 P1e(3.5)
6692.94867	-0.00932	14937.01557	0.001	9-6 P2e(10.5)	6848.62296	-0.00012	14560.03764	0.211	2-0 P2f(2.5)
6693.76253	-0.00388	14935.19945	0.001	9-6 P2f(10.5)	6866.26906	0.00137	14559.7049	0.211	2-0 P2e(2.5)
6697.12033	-0.00187	14927.71124	0.172	3-1 R2f(5.5)	6884.42160	0.00260	14521.57934	0.006	9-6 P1f(8.5)
6707.00763	0.00116	14905.70516	0.214	2-0 P1f(6.5)	6885.35192	0.00337	14519.61302	0.005	9-6 P1e(8.5)
6707.68219	0.00061	14904.20616	0.213	2-0 P1e(6.5)	6887.46882	-0.00054	14515.15455	0.196	2-0 P1f(2.5)
6716.90203	-0.00148	14883.74813	0.292	3-1 R1e(1.5)	6887.62296	-0.00012	14514.82972	0.197	2-0 P1e(2.5)
6717.00933	-0.00055	14883.51037	0.291	3-1 R1f(1.5)	6889.99041	0.00291	14499.32028	0.004	9-6 P2e(2.5)
6717.49121	0.00118	14882.44270	0.146	2-0 P2e(5.5)	6890.37933	0.00264	14498.50247	0.004	9-6 P2f(7.5)
6717.80108	-0.00014	14881.75622	0.150	2-0 P2f(5.5)	6911.21728	-0.00060	14465.27722	0.106	2-0 P2f(1.5)
6727.47990	0.000418	14804.20616	0.213	2-0 P1e(6.5)	6911.33374	-0.00026	14463.03347	0.103	2-0 P2e(1.5)
6741.59684	-0.00191	14829.22813	0.346	3-1 R1e(2.5)	6913.02411	0.00421	14461.49448	0.001	2-0 Q1f(6.5)
6741.76893	-0.00010	14828.84960	0.349	3-1 R1f(2.5)	6916.34102	-0.00465	14455.56109	0.001	2-0 Q1f(6.5)
6754.07466	0.00001	14801.83182	0.192	3-1 R2f(2.5)	6930.33393	0.00298	14425.37611	0.001	2-0 Q1e(5.5)
6754.15490	-0.00040	14801.65597	0.209	3-1 R2e(2.5)	6933.65184	-0.00079	14420.55302	0.001	2-0 Q1f(5.5)
6755.70724	-0.000317	14798.25482	0.003	9-6 P1f(10.5)	6942.43113	0.00433	14400.23982	0.008	9-6 P1e(7.5)
6756.56288	0.00089	14796.38079	0.286	3-1 R2f(1.5)	6943.19191	0.00529	14398.66196	0.008	9-6 P1e(7.5)
6757.01438	-0.00497	14795.39210	0.003	9-6 P1e(10.5)	6944.78326	0.00184	14395.36260	0.003	2-0 Q1e(4.5)
6757.10283	0.0001	14795.19843	0.275	2-0 P1e(5.5)	6946.27188	-0.00152	14399.27760	0.003	2-0 Q1f(4.5)
6764.07733	-0.00239	14779.94295	0.324	3-1 R1e(3.5)	6948.02707	0.00192	14388.64186	0.001	2-0 Q2e(3.5)
6764.30407	0.00012	14779.44752	0.323	3-1 R1f(3.5)	6949.40464	-0.00608	14387.85999	0.001	2-0 Q2f(3.5)
6765.01040	-0.00255	14776.90441	0.002	9-6 P2f(9.5)	6954.23490	0.00524	14375.79754	0.005	9-6 P2e(6.5)
6769.29179	0.00188	14768.55778	0.200	2-0 P2e(4.5)	6954.50113	0.00392	14375.24721	0.005	9-6 P2f(6.5)

TABLE 30—Continued

Wavenumber (cm ⁻¹)	O-C (cm ⁻¹)	Wavelength (Angstroms)	Rel Int	Identification	Wavenumber (cm ⁻¹)	O-C (cm ⁻¹)	Wavelength (Angstroms)	Rel Int	Identification
6956.38852	0.00017	14371.34695	0.006	2-0 Q1e(3.5)	7150.81416	0.00174	13980.59947	0.020	2-0 R2f(5.5)
6957.22484	-0.00180	14369.61938	0.007	2-0 Q1f(3.5)	7151.07661	0.00191	13980.08638	0.023	2-0 R2e(5.5)
6959.12175	0.00000	14365.70252	0.001	2-0 Q2e(2.5)	7154.49389	0.00062	13973.40890	0.026	2-0 R1e(6.5)
6959.65319	-0.00172	14364.60555	0.001	2-0 Q2f(2.5)	7154.83156	0.00046	13972.74943	0.025	2-0 R1f(6.5)
6963.54798	-0.00101	14356.57126	0.000	8-5 P2e(13.5)	7164.73927	0.00346	13953.42728	0.008	2-0 R2f(6.5)
6965.19369	-0.00069	14353.17514	0.013	2-0 Q1e(2.5)	7165.03601	0.00142	13952.84940	0.009	2-0 R2e(6.5)
6965.56736	-0.00156	14352.40915	0.013	2-0 Q1f(2.5)	7167.39904	0.00361	13948.24926	0.013	2-0 R1e(7.5)
6967.28801	0.00068	14348.86436	0.002	2-0 Q2e(1.5)	7167.74539	0.00194	13947.57527	0.015	2-0 R1f(7.5)
6967.78708	0.00061	14347.83892	0.002	2-0 Q2f(1.5)	7167.89703	-0.00601	13947.28027	0.005	9-6 P1f(2.5)
6971.29089	-0.00114	14340.62500	0.028	2-0 Q1e(1.5)	7167.99431	-0.00519	13947.09091	0.005	9-6 P1e(2.5)
6971.39364	-0.00140	14340.41424	0.028	2-0 Q1f(1.5)	7170.04222	0.00299	13943.10733	0.001	9-6 Q1e(5.5)
6972.37597	-0.00158	14338.39177	0.005	2-0 Q2e(0.5)	7171.36492	0.00119	13940.53564	0.001	9-6 Q1e(5.5)
6972.67785	-0.00158	14337.77305	0.005	2-0 Q2f(0.5)	7175.38563	-0.00165	13932.72408	0.006	2-0 R2f(7.5)
6996.16638	0.00406	14289.63616	0.009	9-6 P1f(6.5)	7175.70136	-0.00224	13932.11104	0.007	2-0 R2e(7.5)
6996.76539	0.00560	14288.41279	0.009	9-6 P1e(6.5)	7177.30469	0.00709	13928.99876	0.009	2-0 R1e(8.5)
7009.41531	0.00352	14262.62339	0.006	9-6 P2e(5.5)	7184.15702	0.00194	13915.71310	0.007	2-0 R1e(9.5)
7009.56944	0.00365	14262.31278	0.006	9-6 P2f(5.5)	7188.21868	-0.00486	13907.85010	0.003	9-6 P2f(1.5)
7028.74896	-0.00068	14223.39479	0.070	2-0 R2e(0.5)	7188.33566	-0.00462	13907.62377	0.003	9-6 P2e(1.5)
7028.83182	-0.00202	14223.22712	0.067	2-0 R2f(0.5)	7192.42207	0.00081	13893.57505	0.001	9-6 Q1e(4.5)
7041.83712	-0.00169	14196.95875	0.001	8-5 P1e(13.5)	7192.63062	-0.01620	13899.31190	0.001	8-5 P1f(11.5)
7045.59336	0.00231	14189.38986	0.010	9-6 P1f(5.5)	7193.29040	0.00295	13899.12409	0.001	9-6 Q1f(4.5)
7046.04263	0.00356	14188.48512	0.011	9-6 P1e(5.5)	7194.13155	0.00105	13896.41919	0.002	8-5 P1e(11.5)
7046.23613	-0.00292	14188.09548	0.001	8-5 P2e(12.5)	7200.12288	0.00296	13897.85575	0.001	8-5 P2e(10.5)
7047.68526	-0.26043	14185.17815	0.001	8-5 P2f(12.5)	7200.98419	0.00202	13883.19498	0.001	8-5 P2f(10.5)
7049.11841	-0.00145	14182.29417	0.117	2-0 R1e(1.5)	7210.45096	0.00091	13864.96738	0.002	9-6 Q1e(3.5)
7049.23489	-0.00139	14182.05932	0.115	2-0 R1f(1.5)	7210.90458	0.00063	13864.09517	0.002	9-6 Q1f(3.5)
7060.50155	0.00488	14159.42904	0.007	9-6 P2e(4.5)	7224.23352	-0.0166	13896.41953	0.004	9-6 P1e(11.5)
7060.55847	0.00086	14159.31489	0.007	9-6 P2f(4.5)	7224.43130	-0.00294	13888.13658	0.004	9-6 Q1f(2.5)
7060.67246	-0.00029	14159.08630	0.201	2-0 R2e(1.5)	7227.16269	-0.00381	13832.90667	0.001	9-6 Q2e(1.5)
7060.67246	-0.00273	14159.08630	0.201	2-0 R2f(1.5)	7227.47953	-0.00139	13832.30026	0.000	9-6 Q2f(1.5)
7075.04494	-0.00124	14130.32302	0.142	2-0 R1e(2.5)	7233.89992	-0.00447	13820.03449	0.007	9-6 Q1e(1.5)
7075.23150	-0.00159	14129.95043	0.141	2-0 R1f(2.5)	7233.95346	-0.00558	13819.92121	0.007	9-6 Q1f(1.5)
7088.63369	-0.00132	14103.23547	0.086	2-0 R2f(2.5)	7234.77611	-0.00522	13818.34977	0.001	9-6 Q2e(0.5)
7088.71941	-0.00056	14159.08630	0.087	2-0 R2e(2.5)	7234.96112	-0.00427	13817.99641	0.001	9-6 Q2f(0.5)
7090.68660	-0.00063	14099.15226	0.010	9-6 P1f(4.5)	7263.07080	-0.0697	13764.51765	0.002	8-5 P1f(10.5)
7090.99894	0.00085	14098.53123	0.010	9-6 P1e(4.5)	7264.37981	-0.00624	13762.03733	0.002	8-5 P1e(10.5)
7098.76763	-0.00086	14083.10217	0.013	2-0 R1e(3.5)	7271.31942	0.00329	13748.90308	0.002	8-5 P2e(9.5)
7099.01388	-0.00233	14082.61366	0.111	2-0 R1f(3.5)	7272.03215	-0.00335	13747.53666	0.002	8-5 P2f(9.5)
7107.42162	0.01585	14069.95457	0.010	9-6 P2e(3.5)	7273.91410	0.00390	13743.99870	0.004	9-6 R2f(1.5)
7107.42162	-0.01341	14065.95457	0.010	9-6 P2f(3.5)	7273.91410	-0.01219	13743.99870	0.004	9-6 R2e(0.5)
7112.87002	-0.00002	14055.18015	0.059	2-0 R2f(3.5)	7275.14055	-0.01341	13741.68172	0.001	9-6 R1f(9.5)
7113.02951	-0.00022	14054.86500	0.058	2-0 R2e(3.5)	7290.29047	-0.00175	13713.12515	0.004	9-6 R1e(1.5)
7118.23805	-0.02942	14044.58079	0.001	8-5 P1f(12.5)	7290.33626	-0.00158	13713.03902	0.004	9-6 R1f(1.5)
7119.94033	0.00220	14041.22292	0.001	8-5 P1e(12.5)	7292.10413	-0.00131	13709.71447	0.003	9-6 R2f(1.5)
7120.04372	-0.00023	14041.01933	0.087	2-0 R1e(4.5)	7292.15074	-0.00085	13709.62684	0.003	9-6 R2e(2.5)
7120.33332	-0.00063	14040.44776	0.040	2-0 R2f(4.5)	7293.11716	-0.01343	13707.81016	0.001	9-6 R1f(8.5)
7125.09362	0.00122	14031.06746	0.001	8-5 P2e(11.5)	7293.34530	-0.00341	13707.38137	0.001	9-6 R1e(8.5)
7126.11375	0.00164	14029.05886	0.001	8-5 P2f(11.5)	7303.43953	0.00245	13668.43609	0.005	9-6 R1e(2.5)
7131.44134	-0.00311	14018.57834	0.009	9-6 P1f(3.5)	7305.50388	0.00056	13688.31549	0.005	9-6 R1f(2.5)
7131.63528	-0.00267	14018.19712	0.009	9-6 P1e(3.5)	7305.03700	0.00061	13685.44269	0.003	9-6 R2f(2.5)
7133.55342	0.00028	14014.42776	0.040	2-0 R2f(4.5)	7305.13667	0.00252	13665.25597	0.003	9-6 R2e(2.5)
7133.77072	0.00085	14014.00087	0.038	2-0 R2e(4.5)	7305.70899	-0.00323	13684.18388	0.001	9-6 R2f(6.5)
7138.66993	0.00061	14003.38310	0.051	2-0 R1e(5.5)	7305.84104	-0.00150	13683.93655	0.001	9-6 R1f(6.5)
7138.99093	-0.00046	14003.75346	0.049	2-0 R1f(5.5)	7306.25190	-0.00600	13683.16704	0.001	9-6 R1f(7.5)
7150.01904	-0.00271	13982.15419	0.005	9-6 P2f(2.5)	7306.38955	-0.00308	13682.90926	0.001	9-6 R1e(7.5)
7150.10579	-0.00120	13981.98455	0.005	9-6 P2e(2.5)	7312.63745	0.00467	13671.21859	0.005	9-6 R1e(3.5)

TABLE 30—Continued

Wavenumber (cm ⁻¹)	O-C (cm ⁻¹)	Wavelength (Angstroms)	Rel Int	Identification	Wavenumber (cm ⁻¹)	O-C (cm ⁻¹)	Wavelength (Angstroms)	Rel Int	Identification
7312.70159	0.00247	13671.09868	0.005	9-6 R1f(3.5)	7739.37143	0.00034	12917.41274	0.003	8-5 O1f(2.5)
7312.79068	0.00287	13670.92113	0.003	9-6 R2f(3.5)	7742.28008	-0.00402	12912.55987	0.000	8-5 Q2e(1.5)
7312.92791	0.00499	13670.67559	0.003	9-6 R2e(3.5)	7748.47649	0.00087	12902.23375	0.005	8-5 Q1e(1.5)
7313.07732	0.00226	13670.59629	0.002	9-6 R2f(5.5)	7748.53831	-0.00094	12902.13081	0.005	8-5 Q1f(1.5)
7313.23313	0.00164	13670.10504	0.002	9-6 R2e(5.5)	7749.71109	0.00002	12900.17830	0.001	8-5 Q2e(0.5)
7314.65627	-0.00124	13667.44538	0.002	9-6 R1f(6.5)	7749.91694	0.00357	12899.83565	0.001	8-5 Q2f(0.5)
7314.71400	0.00188	13667.33751	0.002	9-6 R1e(6.5)	7753.89011	-0.00445	12893.22564	0.001	7-4 P1f(10.5)
7315.45087	0.00234	13665.96082	0.002	9-6 R2f(4.5)	7755.21048	-0.00231	12891.03049	0.001	7-4 P1e(10.5)
7315.60523	0.00530	13665.77247	0.002	9-6 R2e(4.5)	7761.77696	-0.00086	12889.12463	0.001	7-4 P2e(9.5)
7317.69764	0.00389	13661.76492	0.005	9-6 R1e(4.5)	7762.53185	-0.00176	12878.87206	0.001	7-4 P2f(9.5)
7317.7850	0.00430	13661.68864	0.005	9-6 R1f(4.5)	7779.45862	-0.01984	12871.05754	0.002	8-5 R2f(0.5)
7318.43928	0.00462	13660.38046	0.006	9-6 R1e(5.5)	7791.45862	-0.01582	12831.05754	0.002	8-5 R2e(0.5)
7318.43928	0.00470	13660.38046	0.006	9-6 R1f(5.5)	7808.21146	0.00004	12803.52792	0.003	8-5 R1e(1.5)
7329.52835	-0.00355	13639.71321	0.003	8-5 P1f(9.5)	7808.26876	-0.00052	12803.43396	0.003	8-5 R1f(1.5)
7330.65054	-0.00037	13637.62522	0.003	8-5 P1e(9.5)	7811.55923	-0.01239	12789.04075	0.004	8-5 R2e(1.5)
7330.65054	-0.00181	13622.70809	0.002	8-5 P2e(8.5)	7811.55923	-0.01432	12789.04075	0.004	8-5 R2f(1.5)
7339.24909	-0.00067	13621.64756	0.002	8-5 P2f(8.5)	7811.94277	0.25152	12779.41241	0.000	8-5 R1e(9.5)
7391.95872	-0.00042	13524.51590	0.005	8-5 P1f(8.5)	7820.86776	0.00067	12783.80828	0.001	7-4 P1f(9.5)
7392.90570	-0.00133	13522.78350	0.005	8-5 P1e(8.5)	7822.0967	-0.00101	12782.91515	0.001	7-4 P1e(2.5)
7402.18843	0.00012	13505.85250	0.003	8-5 P2e(7.5)	7823.11307	0.00003	12779.13948	0.004	8-5 R1e(2.5)
7402.62291	-0.00223	13505.05521	0.003	8-5 P2f(7.5)	7823.19420	0.00074	12779.00995	0.004	8-5 R1f(2.5)
7450.31794	0.00116	13418.57659	0.006	8-5 P1f(7.5)	7826.46043	0.0151	12773.67386	0.002	8-5 R2f(2.5)
7451.09538	-0.00127	13417.17291	0.006	8-5 P1e(7.5)	7826.54645	-0.01919	12773.53347	0.003	8-5 R2e(2.5)
7461.84159	-0.00204	13397.85336	0.004	8-5 P2e(6.5)	7826.87980	-0.00714	12772.98944	0.001	8-5 R1f(7.5)
7462.15242	-0.00125	13397.29558	0.004	8-5 P2f(6.5)	7826.88816	0.17438	12772.97579	0.001	8-5 R1e(8.5)
7504.55604	0.00134	13321.59595	0.007	8-5 P1f(6.5)	7829.66636	-0.00995	12767.44355	0.001	7-4 P2e(8.5)
7505.17628	-0.00112	13320.49467	0.007	8-5 P1e(6.5)	7830.27936	-0.00177	12767.44396	0.001	7-4 P2f(8.5)
7517.61941	-0.00238	13298.44661	0.005	8-5 P2e(5.5)	7831.23208	-0.00060	12761.00220	0.004	8-5 R1e(3.5)
7517.81296	-0.00015	13298.10423	0.005	8-5 P2f(5.5)	7834.32233	0.00024	12760.85520	0.004	8-5 R1f(3.5)
7554.62170	0.00071	13233.31114	0.008	8-5 P1f(5.5)	7836.32048	-0.00221	12757.60135	0.002	8-5 R2f(3.5)
7555.09252	-0.00150	13232.48646	0.008	8-5 P1e(5.5)	7836.45080	-0.00656	12757.38919	0.003	8-5 R2e(3.5)
7569.49792	-0.00529	13207.30387	0.006	8-5 P2e(4.5)	7836.45170	0.01485	12757.37773	0.003	8-5 R2f(6.5)
7569.58013	0.00281	13207.16043	0.006	8-5 P2f(4.5)	7836.60509	-0.00137	12757.13802	0.001	7-4 P2f(6.5)
7600.47008	0.00015	13298.10423	0.005	8-5 P2f(5.5)	7837.25975	0.05923	12756.07239	0.001	8-5 R1f(7.5)
7600.80226	-0.00078	13152.90873	0.008	8-5 P1e(4.5)	7837.25975	-0.00747	12756.07239	0.001	8-5 R1f(7.5)
7608.40977	-0.00956	13139.75735	0.001	7-4 P1f(12.5)	7841.23450	0.13900	12749.60628	0.002	8-5 R1e(4.5)
7610.111850	-0.00306	13136.80703	0.001	7-4 P1e(12.5)	7841.23881	0.01847	12749.59922	0.002	8-5 R1f(4.5)
7661.8800	0.00303	13126.71288	0.000	7-4 P2f(11.5)	7841.37422	0.08036	12749.37911	0.005	8-5 R1f(4.5)
7661.97050	0.00075	13124.23305	0.001	8-5 P2e(3.5)	7883.94357	-0.00047	12680.53871	0.002	7-4 P1f(8.5)
7661.40954	0.00075	13124.23305	0.010	8-5 P2f(3.5)	7883.05395	-0.00030	12746.64859	0.003	8-5 R1f(6.5)
7667.97386	-0.00029	13124.23305	0.004	8-5 P1f(2.5)	7883.89071	-0.00248	12664.64254	0.003	8-5 R2e(6.5)
7683.05452	-0.00038	13081.85587	0.007	8-5 P1e(3.5)	7884.36335	-0.00205	12746.64859	0.003	8-5 R1e(6.5)
7642.07938	0.00053	13081.50749	0.007	8-5 P1e(3.5)	7884.36335	-0.00042	12744.52920	0.002	8-5 R1e(6.5)
7684.55981	0.00148	13009.54887	0.004	8-5 P2f(2.5)	7884.41325	0.00083	12744.43982	0.002	8-5 R1f(5.5)
7661.26425	-0.00138	13049.10700	0.004	8-5 P2e(2.5)	7883.94357	-0.00047	12680.53871	0.002	7-4 P1f(8.5)
7700.75047	0.00330	12982.19653	0.002	8-5 P2f(1.5)	7954.28204	0.00082	12678.98656	0.002	7-4 P2e(6.5)
7679.58112	0.00023	13017.98301	0.004	8-5 P1e(2.5)	7893.83917	-0.00114	12663.64254	0.001	7-4 P2e(7.5)
7683.05452	-0.00716	13012.05775	0.001	7-4 P1f(11.5)	7894.32030	-0.00506	12663.87068	0.001	7-4 P1f(7.5)
7642.28874	0.00155	13081.50749	0.007	8-5 P1e(3.5)	7943.05073	0.00056	12536.17798	0.002	7-4 P1f(7.5)
7684.55981	0.00148	13009.54887	0.001	7-4 P1e(11.5)	7943.85149	0.00042	12584.90925	0.002	7-4 P1e(7.5)
7691.05940	0.00005	12998.50399	0.001	7-4 P2f(10.5)	7954.28204	-0.00344	12558.40647	0.002	7-4 P2e(6.5)
7700.86721	0.00017	12981.99973	0.002	8-5 P2e(1.5)	7954.62791	-0.00035	12567.85999	0.002	7-4 P2f(6.5)
7708.36725	-0.00063	12969.36856	0.001	8-5 Q1e(4.5)	7993.12965	0.00016	12459.50340	0.003	7-4 P1f(6.5)
7709.30060	0.00235	12967.79838	0.001	8-5 Q1f(4.5)	7998.77231	0.00003	12498.49913	0.003	7-4 P1e(6.5)
7725.82376	-0.00267	12940.06420	0.002	8-5 Q1e(3.5)	8010.97275	-0.00241	12479.46430	0.002	7-4 P2e(5.5)
7726.33882	-0.00148	12939.20492	0.001	8-5 Q1f(3.5)	8011.19998	-0.00178	12479.11033	0.002	7-4 P2f(5.5)
7739.14914	-0.00133	12917.78376	0.003	8-5 Q1e(2.5)	8049.11382	-0.00031	12420.32971	0.003	7-4 P1f(5.5)

TABLE 30—Continued

Wavenumber (cm ⁻¹)	O-C (cm ⁻¹)	Wavelength (Angstroms)	Rel Int	Identification	Wavenumber (cm ⁻¹)	O-C (cm ⁻¹)	Wavelength (Angstroms)	Rel Int	Identification
8049.60708	-0.00109	12419.56862	0.003	7-4 P1e(5.5)	8549.60730	0.00172	11693.24287	0.001	6-3 P2e(4.5)
8063.89129	-0.00335	12397.56881	0.002	7-4 P2e(4.5)	8549.74854	-0.00193	11693.04970	0.001	6-3 P2f(4.5)
8064.00220	0.00128	12397.39810	0.002	7-4 P2f(4.5)	8582.95329	0.00075	11647.81286	0.001	6-3 P1f(4.5)
8095.9404	-0.00146	12348.48355	0.003	7-4 P1f(4.5)	8583.33063	-0.00238	11647.30080	0.001	6-3 P1e(4.5)
8096.29543	-0.00090	12347.94941	0.003	7-4 P1e(4.5)	8600.04491	0.01523	11624.66409	0.001	6-3 P2f(3.5)
8112.98942	0.00807	12322.54114	0.005	7-4 P2f(3.5)	8600.04491	-0.01532	11624.66409	0.001	6-3 P2e(3.5)
8112.98942	-0.00766	12322.54114	0.005	7-4 P2e(3.5)	8626.75357	-0.00090	11588.67374	0.001	6-3 P1f(3.5)
8138.57899	-0.0095	12283.79615	0.003	7-4 P1e(3.5)	8626.99852	-0.00431	11588.34470	0.001	6-3 P1e(3.5)
8138.80438	-0.00176	12283.45597	0.003	7-4 P1e(3.5)	8666.35994	-0.00455	11535.71190	0.001	6-3 P1f(2.5)
8158.0899	0.00496	12254.43151	0.002	7-4 P2f(2.5)	8666.48463	-0.00165	11535.54593	0.001	6-3 P1e(2.5)
8158.14999	0.00056	12254.32787	0.002	7-4 P2e(2.5)					
8177.03143	-0.00290	12226.03156	0.002	7-4 P1f(2.5)					
8177.14631	-0.00064	12225.85979	0.002	7-4 P1e(2.5)					
8199.08816	0.00469	12193.14170	0.001	7-4 P2f(1.5)					
8199.20861	-0.00013	12192.96558	0.001	7-4 P2e(1.5)					
8226.82802	-0.000383	12152.02783	0.001	7-4 Q1e(3.5)					
8227.39600	0.00098	12151.18591	0.001	7-4 Q1f(3.5)					
8235.86420	0.00001	12138.69490	0.000	6-3 P1e(10.5)					
8239.87468	-0.00014	12132.78679	0.001	7-4 Q1e(2.5)					
8240.12833	-0.000315	12132.41332	0.001	7-4 Q1f(2.5)					
8248.99426	-0.00004	12119.37350	0.002	7-4 Q1e(1.5)					
8249.06390	-0.00221	12119.27119	0.002	7-4 Q1f(1.5)					
8255.66814	0.00870	12116.91474	0.000	7-4 Q2f(0.5)					
8310.89789	0.00281	12029.10229	0.000	6-3 P2e(8.5)					
8311.90550	0.00221	12027.64406	0.001	7-4 R1e(1.5)					
8311.97558	-0.00185	12027.54466	0.001	7-4 R1f(1.5)					
8316.52836	0.01094	12020.95831	0.001	7-4 R2e(1.5)					
8316.52836	-0.00689	12020.95831	0.001	7-4 R2f(1.5)					
8328.37313	-0.00180	12003.86184	0.001	7-4 R1e(2.5)					
8328.47120	-0.00230	12003.72049	0.002	7-4 R1f(2.5)					
8333.19919	-0.00170	11996.90995	0.001	7-4 R2f(2.5)					
8333.27844	-0.00416	11996.79536	0.001	7-4 R2e(2.5)					
8341.16447	0.00242	11985.45564	0.001	7-4 R1e(3.5)					
8341.28138	-0.00078	11985.2856	0.001	7-4 R1f(3.5)					
8344.87396	-0.00260	11980.12582	0.001	7-4 R2f(3.5)					
8344.99491	-0.00260	11979.95218	0.001	7-4 R2e(3.5)					
8350.09207	-0.00101	11972.63923	0.001	7-4 R1e(4.5)					
8350.19989	0.00244	11972.48463	0.001	7-4 R1f(4.5)					
8351.66493	0.32735	11970.38443	0.000	7-4 R1f(7.5)					
8351.81241	0.18513	11970.17305	0.001	7-4 R1e(7.5)					
8353.69334	-0.01200	11967.47782	0.001	7-4 R2f(5.5)					
8354.96367	-0.00034	11965.65522	0.001	7-4 R1e(5.5)					
8355.05506	-0.00164	11965.52734	0.001	7-4 R1f(5.5)					
8366.50458	-0.00348	11949.15254	0.000	6-3 P1f(8.5)					
8367.49621	-0.00118	11947.73644	0.001	6-3 P1e(8.5)					
8376.07728	0.00320	11935.49628	0.001	6-3 P2e(7.5)					
8426.66405	-0.00018	11863.84520	0.001	6-3 P1f(7.5)					
8427.49094	0.00200	11862.68114	0.001	6-3 P1e(7.5)					
8437.60755	-0.00408	11848.45787	0.001	6-3 P1f(6.5)					
8437.98200	0.00219	11847.93207	0.001	6-3 P2f(6.5)					
8482.84624	-0.00152	11785.27036	0.001	6-3 P1f(6.5)					
8483.51278	0.00241	11784.34441	0.001	6-3 P1e(6.5)					
8495.45809	-0.00487	11767.77461	0.001	6-3 P2e(5.5)					
8495.71307	-0.00429	11767.42143	0.001	6-3 P2f(5.5)					
8534.96843	-0.00222	11713.29875	0.001	6-3 P1f(5.5)					
8535.48272	0.00187	11712.59228	0.001	6-3 P1e(5.5)					

unique perturber Hamiltonian with the fitted and constrained parameters reported in Table 26. Similar tables have been given by Coxon & Foster (1982). Our new tables provide two orders of magnitude more accuracy and extend to higher J -values. The recent work of Copeland, Chalamala, & Coxon (1993) provides another measurement of the high-lying vibrational states with $v > 7$, and their parameters are in reasonable agreement with the parameters reported. Line positions are predicted for infrared and visible transitions in the $\Delta v = 3, 4, 5$, and 6 vibrational sequences that are not directly measured in the present work. A prepublication form of this list has become a de facto calibration standard for astronomical measurements. Wavelengths in air are given based on the formula given by Edlen (1966). Table 28 summarizes the bands predicted, and Table 29 contains a frequency-ordered listing of the predicted line positions. Table 30 presents the observed and measured line positions (with relative intensities) in a comparable form that may be more useful for non-Fourier transform measurements.

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