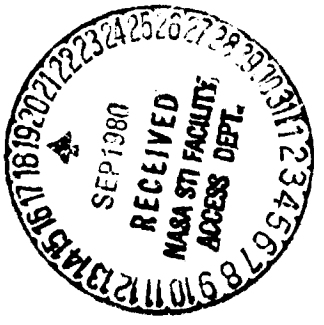
NSG-1432



Department of Physics

University of Denver

NEW ATLAS OF IR SOLAR SPECTRA

by

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ABSTRACT

This report summarizes the work accomplished on the ground-based high resolution solar spectral atlas in the 2.5 to 15 μm region. Over 4500 absorption lines have been marked on the spectra and the corresponding line positions (in cm^{-1}) tabulated. The associated absorbing telluric or solar species for more than 90% of these lines have been identified and only a fraction of the unidentified lines have peak absorptions greater than a few percent. The atlas includes spectra at ~0.06 cm^{-1} resolution obtained between 1976 and 1978 from Denver (1.6 km) and the nearby Mount Evans (4.3 km) at both high sun and low sun from 775 to 1300 cm^{-1} and from 1925 to 2175 cm^{-1}. The high resolution and the low sun spectra greatly enhance the sensitivity limits for identification of trace constituents.

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I. INTRODUCTION

Many molecules known or predicted to be present in the earth's atmosphere have strong infrared absorption bands. In 1939 Adel[1] determined that the absorption at 7.8 μm present in infrared solar spectra obtained from the ground is due to the presence of N_2O in the earth's atmosphere. This was the first detection using infrared techniques of a molecule in the earth's atmosphere not known to be present from other measurements. Since that time infrared spectral techniques, particularly the analysis of infrared solar spectra obtained under various conditions, have played a major role in the detection and quantification of many minor atmospheric constituents. Under high resolution the infrared solar spectrum as observed from the ground contains thousands of lines of telluric origin. Most of these are due to H_2O, CO_2, O_3, CH_4, CO and N_2O superimposed on the Fraunhofer spectrum. Any attempt to observe a molecule of atmospheric interest such as CF_2Cl_2, ClO, NO, $ClONO_2$, etc. must start by insuring that the particular feature in question is indeed attributable to the molecule of interest and not to one of the other known atmospheric constituents nor to solar lines. (The solar lines are extremely important, for example, in the NO region[2].) Most investigators start by comparing their spectra with one of the available atlases. For the middle infrared this has long been the Migeotte et al.[3] Jungfraujoch grating spectrometer Atlas, published in 1956 and 1957. More recently, a grille spectrometer atlas was generated by Lado-Bordowsky[4] and published in 1975. With the improvements that have been made in infrared detectors and computers it is now possible to obtain infrared solar spectra at much higher spectral resolution than the earlier work and in much less time (many spectra in one day at various solar zenith angles versus several months for the Migeotte atlas).

It was in view of these advances and the current interest in remote measurement of many pollutants as well as natural trace constituents, that we undertook the analysis of new, high resolution solar spectra in the 2.5 to 15 μm region, the results of which are presented in the present solar atlas. These spectra, collected from Denver (elevation 1.6 km) and nearby Mt. Evans (elevation 4.3 km) in connection with ongoing NASA sponsored research programs at the University of Denver, are ideally suited for publication in a solar atlas as a consequence of the high altitude and typically low humidity of these sites, which tend to minimize the degree to which absorption by trace constituents is obscured by strong absorption bands of H_2O and CO_2.

In this atlas we present spectra covering the regions 775 - 1300 cm^{-1} and 1925 - 2175 cm^{-1}. The region from 1310 - 1900 cm^{-1} is dominated in ground-based solar spectra by numerous very strong H_2O absorption bands (as well as bands of CH_4, O_3, N_2O, HNO_3, NO_2 and CO_2), and is essentially totally absorbed even in the present high altitude data.

II. RESULTS

A. Description of the Atlas

The solar spectra presented here were obtained with a Michelson-type Fourier spectrometer manufactured by EOCOM Corporation, Irvine, California, having an apodized FWHM resolution ~0.06 cm^{-1}. Details of the equipment have been discussed previously by Bradford et al.[5] Solar radiation was fed into the interferometer using a heliostat. A system of fore-optics using four flat mirrors was used to insure alignment of the solar beam with the instrument axis. Wavenumber calibration was performed using accurately known positions of CO_2 and N_2O absorption lines.

The atlas consists of two volumes: the first volume contains tables of line positions and identifications and the second contains the spectra. (In this report, the spectra and the corresponding tables are presented in the appendices.) The analyzed spectra are shown in Frames 1 - 21 and 47 - 56. (Frames 22 - 46 represent the nearly totally absorbed region 1300 - 1925 cm^{-1} mentioned above. A gap has been left in the numbering of the frames in the event that new data, possibly balloon flight data, become available under proposed additional work on this atlas.) Each frame shows signal amplitude as a function of wavenumber over a 25 cm^{-1} interval for two different zenith angles, one at high sun and one at low sun. Each frame has a 2.5 cm^{-1} overlap at both the high and low wavenumber ends to assist the user in aligning adjacent spectral regions. The positions of the observed spectral lines are indicated by vertical marks which are numbered consecutively in each frame, and every tenth mark is labeled. Each frame is numbered independently. In some cases the absorption feature marked cannot be clearly seen in the spectra, but its existence has been established from several additional spectra taken at different zenith angles. Occasionally such a feature can be seen more clearly in the corresponding high sun scan, and therefore is marked on both the high and low sun scans.

For each frame there is a corresponding table of line positions and molecular identifications. In those cases in which there are multiple molecular identifications, the sequence in which the molecular species are listed represents the relative importance of these species in producing that line as it appears in the low sun scan. The criterion for the inclusion of a given species in such cases of multiple identification for a single (blended) observed line is somewhat subjective. All species having

absorption lines sufficiently near the observed line to contribute to it are included if their contribution to the observed total absorption is estimated to be visibly discernable. However, because of the large variations in the abundance of atmospheric water vapor, we have included H_2O lines in the identifications which are considerably less intense that implied by this criterion. Species identifications which are considered dubious are marked with question marks, while lines which are believed to be too strong or too broad to be attributable solely to the indicated species are denoted by "+?". Absorption features with which we have been unable to associate a molecular (or atomic) species are denoted by a question mark in the identification column.

There are several absorption lines in the region between 800 and 925 cm^{-1} which, judging from their lack of growth with increasing airmass, appear to be solar rather than telluric in origin. Where possible, a tentative atomic identification has been made for these lines. All such identifications, however, are considered dubious and accordingly bear question marks. Lines which appear very likely to be solar in origin but cannot be associated with an atomic species are simply marked "solar" or "solar?" if appropriate (e.g., lines on the wings of atmospheric lines, whose lack of growth with airmass is difficult to judge).

Line identification procedures are discussed in a separate section below, but it is appropriate to mention here that in performing the species identifications a number of discrepancies in line positions between our spectra and the AFGL atmospheric line parameters tapes[6] have been observed, particularly with regard to H_2O lines. Cases where this discrepancy exceeds 0.1 cm^{-1} are denoted with an asterisk on the species identification (e.g. "H_2O^*").

The tabulated line positions were accurately determined using a special line-finding computer program which tests the spectra for changes in slope over intervals of consecutive data points and records the position of every change exceeding a specified criterion. For well resolved lines, line positions determined with this program have an estimated accuracy of ±0.005 cm^{-1} with reference to standard calibration lines of CO_2 and N_2O.

In these spectra there are numerous regions characterized by saturated absorption. In these regions the following convention applies: if a region of 100% absorption is narrower than 0.25 cm^{-1}, then the estimated line center is marked and the corresponding tabulated line position is given to only two decimal places; whereas, if a region of 100% absorption is wider than 0.25 cm^{-1}, then the end points of that region are marked and the corresponding tabulated line positions are joined by a curly bracket.

B. Line Identifications

The results of Biémont and Grevesse[7] were used for the identification of solar atomic lines, while solar CO lines were identified on the basis of unpublished calculations by A. Goldman and R. D. Blatherwick of line positions and intensities for the $\Delta v = 1$ vibrational-rotational transitions. These calculations were performed using the Dunham coefficients of Todd et al.,[8] and the dipole moment matrix elements of Young and Eachus[9]. Atmospheric molecular absorption lines were identified with the aid of the AFGL atmospheric absorption line parameters compilation[6] and several other sources (references 10-18) including laboratory spectra recorded at the University of Denver[10]. In the case of the ν_4 band of CH_4, inadequacies in the existing references prompted the preparation (in collaboration with personnel at NASA Ames Research Center) of a new atlas of methane spectra in the 1120 - 1800 cm^{-1} region[11]. Table I lists the references other than

the AFGL compilation[6] which were used for identification of atmospheric molecular absorption features, and the wavenumber intervals over which those references were used.

During the atlas work in the 775 to 950 cm^{-1} regions, absorption lines belonging to the ν_2 band of atmospheric NH_3 were identified for the first time. The results are presented and discussed in Murcray et al.[19] It is with reference to the sunset spectra of that work, in which the NH_3 lines are much more prominent than in the spectra displayed here, that the present NH_3 line identifications were made. More recently, the ν_3 vibration-rotation band of CF_4 has been identified[20] near 1283 cm^{-1} in atlas-related work with balloon data at higher resolution. (This band cannot be clearly isolated on the present ground based spectra because of strong absorption by other overlapping species, but it is still present as background to the present spectra.) The same balloon data were also used for a new analysis of the O_3 ν_1 region[13].

III. SUMMARY

High resolution, ground-based infrared solar spectra covering the frequency intervals 775 - 1300 cm^{-1} (7.69-12.90 μm) and 1925 - 2175 cm^{-1} (4.60 - 5.19 μm) have been analyzed and the results presented in a new solar atlas. More than 4500 spectral features in these data have been identified as being genuine telluric or solar absorption lines. The corresponding frequencies (in cm^{-1}) have been tabulated, as have the atomic or molecular species responsible for producing over 90% of these absorption lines. Only a fraction of the unidentified lines have peak absorptions greater than a few percent.

During the course of this work, it became evident that for many of the trace species (e.g., HNO_3, NH_3, CF_4, OCS, CF_2Cl_2, $CFCl_3$) and less frequently even for the more common species (e.g., H_2O, O_3, CH_4, CO_2, N_2O) existing references are often inadequate for the identification of these species in high resolution solar spectra. Consequently, laboratory spectra of many of these molecules were taken at the University of Denver in conjunction with this (and other) projects and are being published separately[10].

Under proposed further work on this atlas, we anticipate extending the present work to new spectral regions with higher resolution (~0.02 cm^{-1}) data as well as with data of the same resolution as in the present spectra.

IV. ACKNOWLEDGMENTS

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V. REFERENCES

1. A. Adel, "Note on the Atmospheric Oxides of Nitrogen," Astrophys. J. 90, 627 (1939).

2. D. G. Murcray, A. Goldman, W. J. Williams, F. H. Murcray, J. Van Allen and S. C. Schmidt, "Observations of the Solar Spectrum in the 1800-2100 cm^{-1} Region and the Search for NO Lines," Preceedings of the Third Conference on CIAP, Feb. 1974, p. 246-253; F. J. Murcray, A. Goldman, D. G. Murcray, G. R. Cook, J. W. Van Allen and R. D. Blatherwick, "Identification of Isolated NO Lines in Balloon-Borne Infrared Solar Spectra," Geophys. Res. Lett., in press, 1980.

3. M. Migeotte, L. Neven and J. Swensson, The Solar Spectrum from 2.8 to 23.7 microns: Part I, Mém. Soc. Roy. Sci. Liège Spec. Vol. 1 (1956); Part II, Mém. Soc. Roy. Sci. Liège, Spec. Vol. 2 (1957).

4. O. Lado-Bordowsky, "Absorption et emission en infrarouge de la basse atmosphere", Université Pierre et Marie Curie, Laboratoire de Spectroscopie Moleculaire, Paris, France (1975).

5. C. M. Bradford, F. H. Murcray, J. W. Van Allen, J. N. Brooks, D. G. Murcray and A. Goldman, "Ground Level Detection and Feasibility for Monitoring of Several Trace Atmospheric Constituents by High Resolution Infrared Spectroscopy," Geophys. Res. Lett. 3, 387-390 (1976).

6. R. A. McClatchey, W. S. Benedict, S. A. Clough, D. E. Burch, R. F. Calfee, K. Fox, L. S. Rothman and J. S. Garing, "AFCRL Atmospheric Absorption Line Parameters Compilation," AFCRL-TR-73-0096, Environmental Research Papers, No. 434, Air Force Cambridge Research Laboratories, L. G. Hanscom Field, Bedford Mass. 01730, 26 Jan. (1973); L. S. Rothman and R. A. McClatchey, "Updating of the AFCRL Line Parameters

Compilation," Appl. Opt. 15, 2616-2617 (1976); L. S. Rothman, S. A. Clough, R. A. McClatchey, L. G. Young, D. E. Snider and A. Goldman, "AFGL Trace Gas Compilation," Appl. Opt. 17, 507 (1978); L. S. Rothman "Update of the AFGL Atmospheric Absorption Line Parameters Compilation," Appl. Opt. 17, 3517-3518 (1978).

7. E. Biémont and N. Grevesse, "Infrared Wavelengths and Transition Probabilities for Atoms, $3 \leq Z \leq 20$," Atomic Data Nucl. Data Tables 12, 217-310 (1973).

8. T. R. Todd, C. M. Clayton, W. B. Telfair, T. K. McCubbin, Jr. and J. Pliva, "Infrared Emission of $^{12}C^{16}O$, $^{13}C^{16}O$, and $^{12}C^{18}O$," J. Mol. Spectrosc. 62, 201-227 (1976).

9. Lee A. Young and W. James Eachus, "Dipole Moment Function and Vibration-Rotation Matrix Elements for CO," J. Chem. Phys. 44, 4195-4206 (1966).

10. David G. Murcray and Aaron Goldman, Eds., "Atlas of High Resolution Infrared Laboratory Spectra of Atmospheric Interest," CRC Handbook, in press (1980).

11. R. D. Blatherwick, A. Goldman, B. L. Lutz, P. M. Silvaggio, and R. W. Boese, "Infrared Methane Spectra Between 1120 cm^{-1} and 1800 cm^{-1}: A New Atlas," Appl. Opt. 18, 3798-3804 (1979).

12. J.-M. Flaud, C. Camy-Peyret, J.-Y. Mandin and G. Guelachvili," $H_2{}^{16}O$ Hot Bands in the 6.3 μm Region," Molec. Phys. 34, 413-426 (1977); C. Camy-Peyret and J.-M. Flaud, "Line Positions and Intensities in the ν_2 Band of $H_2{}^{16}O$," Molec. Phys. 32, 523-537 (1976).

13. A. Barbe, C. Secroun, P. Jouve, A. Goldman and D. G. Murcray, "High Resolution Infrared Atmospheric Spectra of Ozone in the 10 μm Region:

Analysis of ν_1 and ν_3 Bands and Assignment of the $(\nu_1+\nu_2)-\nu_2$ Band, "J. Mol. Spectrosc., to be published, 1980.

14. J.-M. Flaud, C. Camy-Peyret, A. Barbe, C. Secroun and P. Jouve, "Line Positions and Intensities for the $2\nu_3$, $\nu_1+\nu_3$, and $2\nu_1$ Bands of Ozone," J. Mol. Spectrosc. 80, 185-199 (1980).

15. W. B. Olson, A. G. Maki and W. J. Lafferty, "Tables of N_2O Absorption Lines for the Calibration of Tunable Infrared Lasers from 522 cm^{-1} to 657 cm^{-1} and from 1115 cm^{-1} to 1340 cm^{-1}," to be published, 1980.

16. J. B. Curtis, "Vibration - Rotation Bands of NH_3 in the Region 670 cm^{-1} - 1860 cm^{-1}," Ph.D. Thesis, Ohio State University (1974).

17. N. Monnanteuil, J. C. Depannemaecker, J. Bellet, A. Barbe, C. Secroun, P. Jouve, S. Giorgianni, Yan-Shek Hoh and K. Narahari Rao, "Microwave and Infrared Study of the ν_2 State of $^{16}O_3$ and Identification of the $(\nu_3+\nu_2)-\nu_2$ Band Lines at 10 μm," J. Mol. Spectrosc. 71, 399-413 (1978).

18. A. Barbe, C. Secroun, P. Jouve, N. Monnanteuil, J. C. Depannemaecker, B. Duterage and J. Bellet, "Infrared and Microwave High-Resolution Spectrum of the ν_3 Band of Ozone," J. Mol. Spectrosc. 64, 343-364 (1977).

19. D. G. Murcray, A. Goldman, C. M. Bradford, G. R. Cook, J. W. Van Allen, F. S. Bonomo and F. H. Murcray, "Identification of the ν_2 Vibration-Rotation Band of Ammonia in Ground Level Solar Spectra," Geophys. Res. Lett. 5, 527-530 (1978).

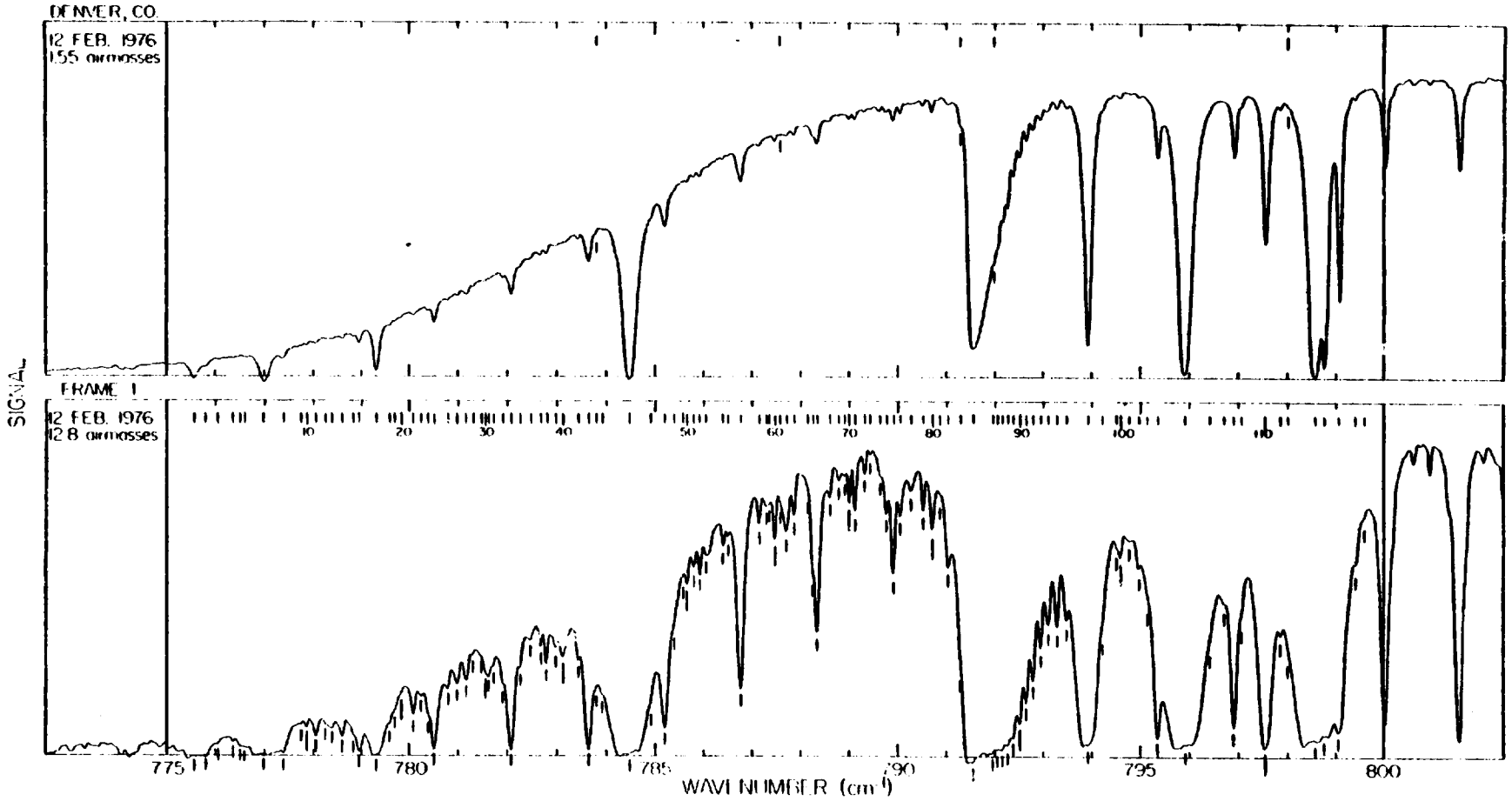
20. A. Goldman, D. G. Murcray, F. J. Murcray, G. R. Cook, J. W. Van Allen, F. S. Bonomo and R. D. Blatherwick, "Identification of the ν_3 Vibration-Rotation Band of CF_4 in Balloon-Borne Infrared Solar Spectra," Geophys. Res. Lett. 6, 609-612 (1979).

Table I. Reference sources in addition to the AFGL compilation[6] used in the identification of atmospheric species. The column labeled "Region" refers to the spectral region in cm^{-1} over which the indicated reference was used for identification.

Species	Region (cm^{-1})	Reference
$CFCl_3$	835 - 855	10
CF_2Cl_2	915 - 935	10
	1160 - 1162	10
CH_4	1120 - 1300	11
H_2O	840 - 1300	12
	1925 - 2175	12
HNO_3	850 - 925	10
NH_3	850 - 950	10, 16
N_2O	1215 - 1245	10, 15
OCS	2025 - 2085	10
O_3	775 - 806	17
	987 - 1049	17
	1007 - 1072	18
	1100 - 1225	13
	1990 - 2170	14

APPENDIX A

SPECTRAL TRACINGS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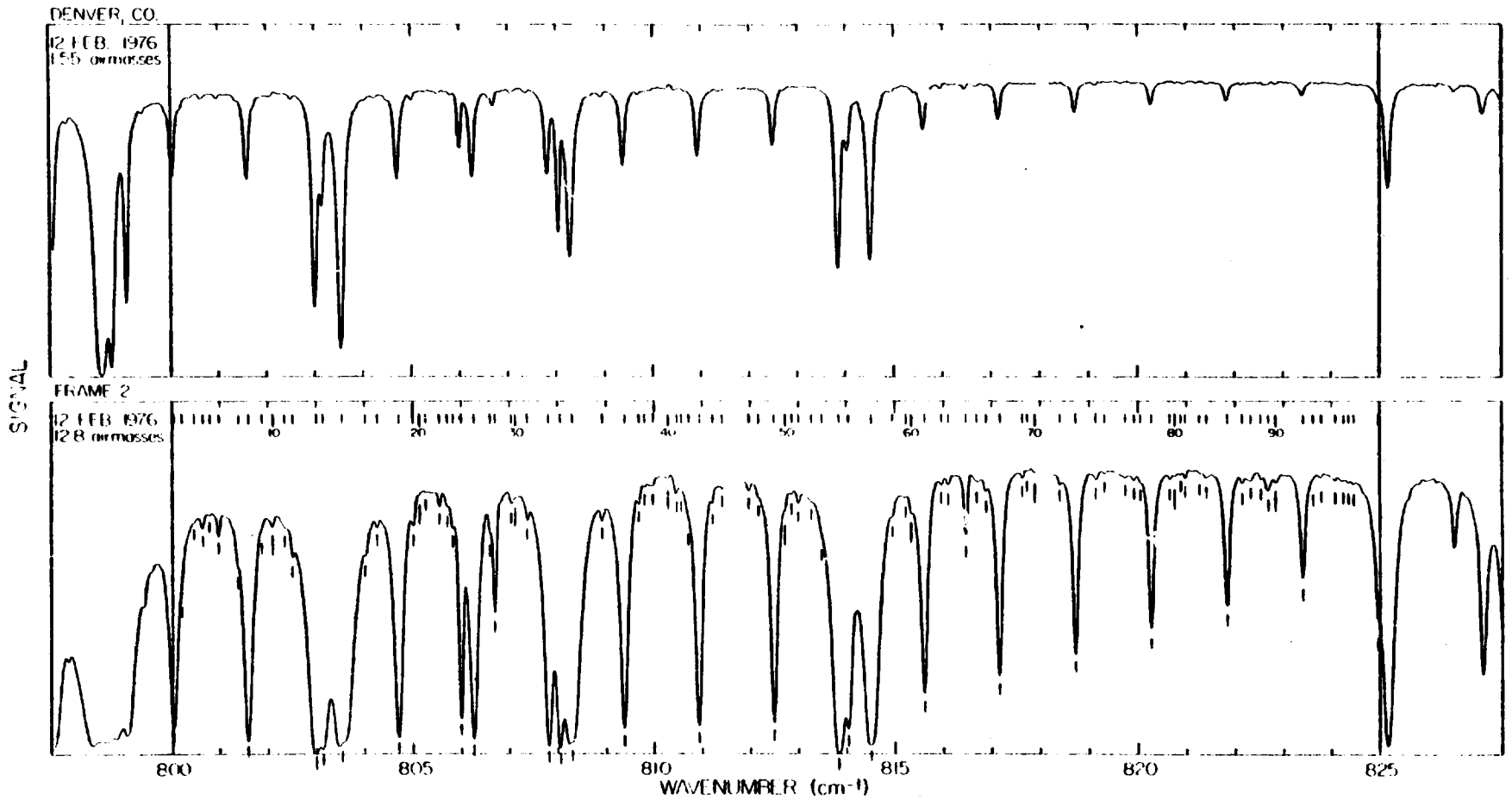
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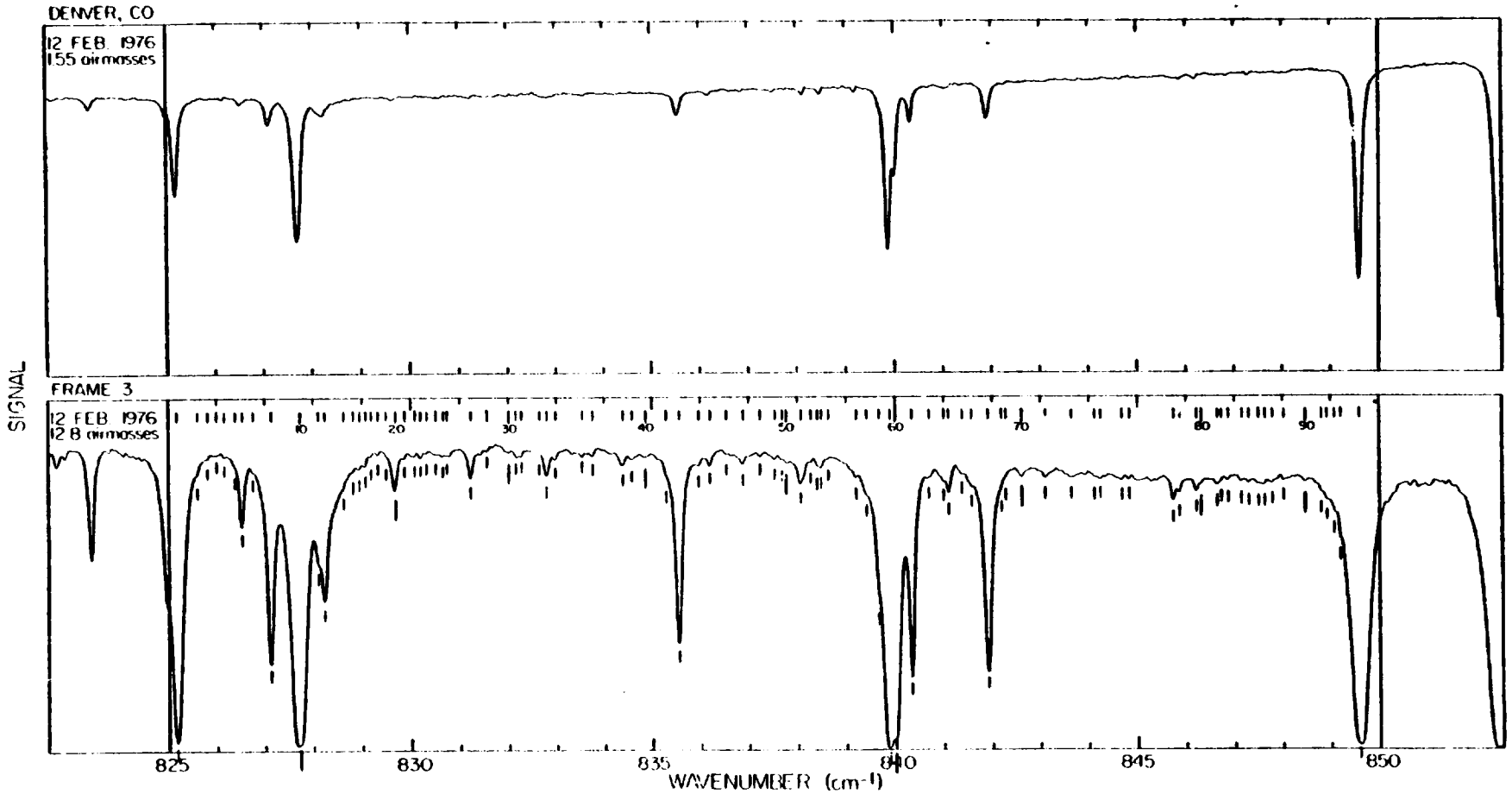
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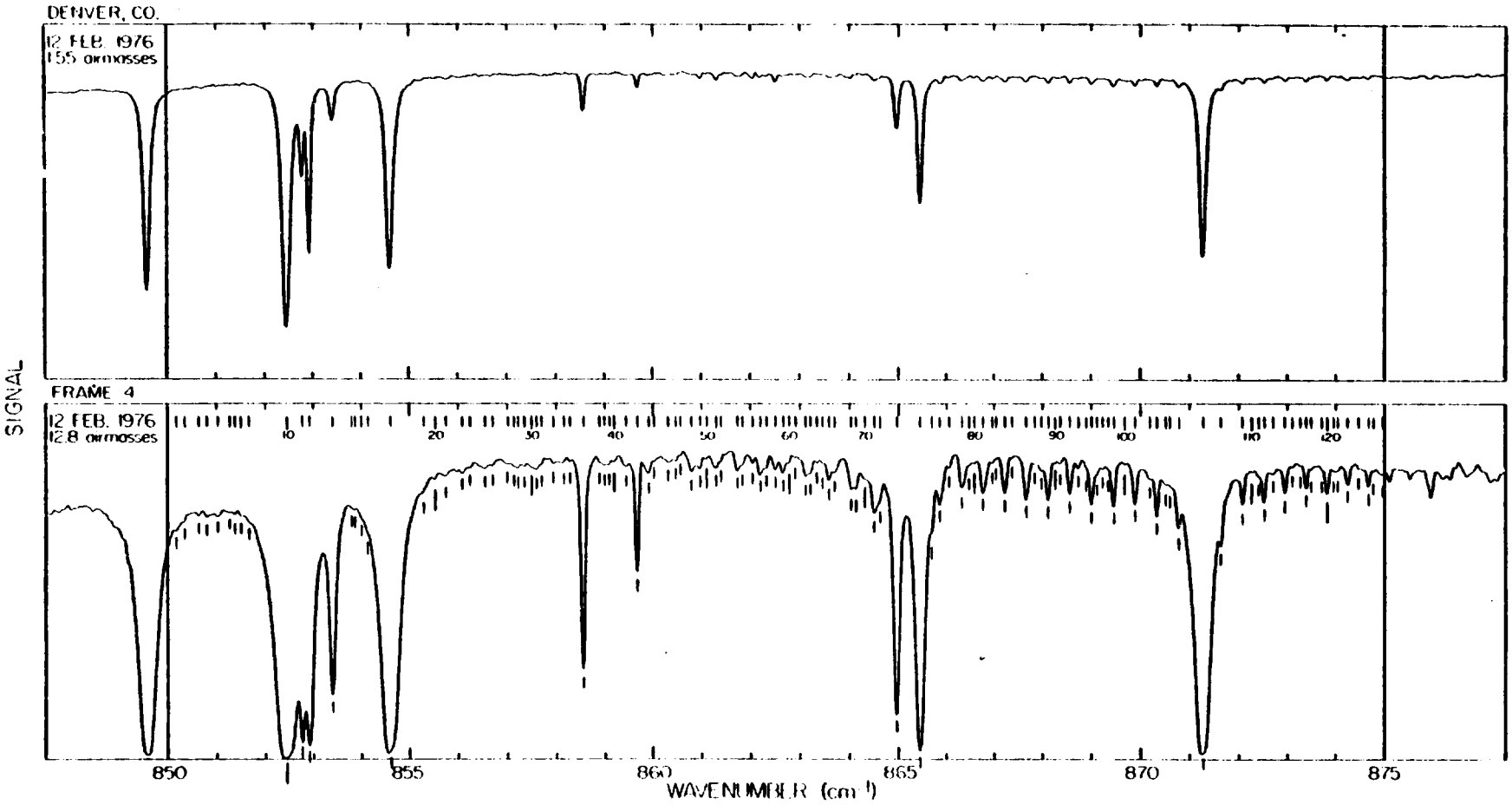
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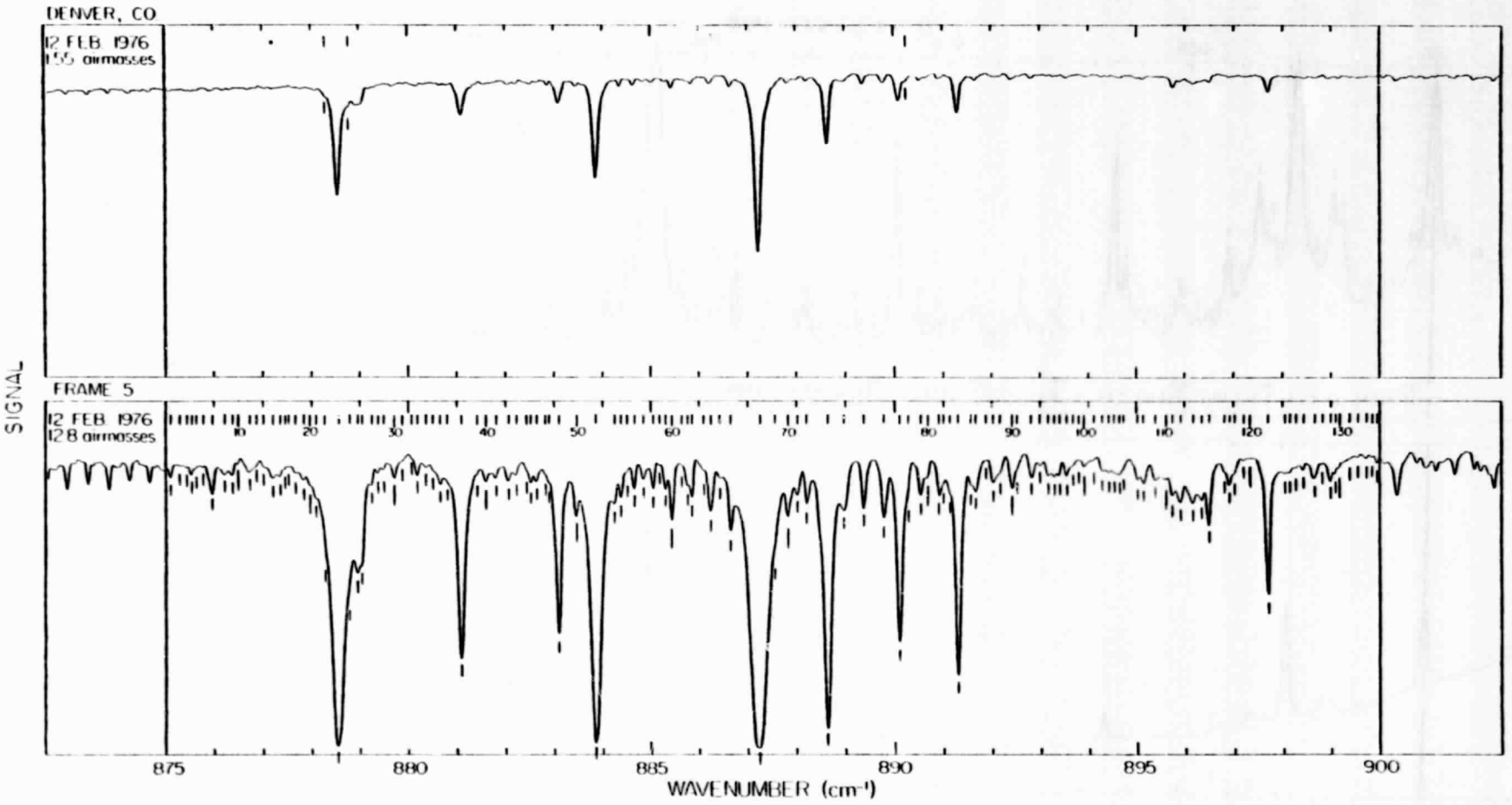
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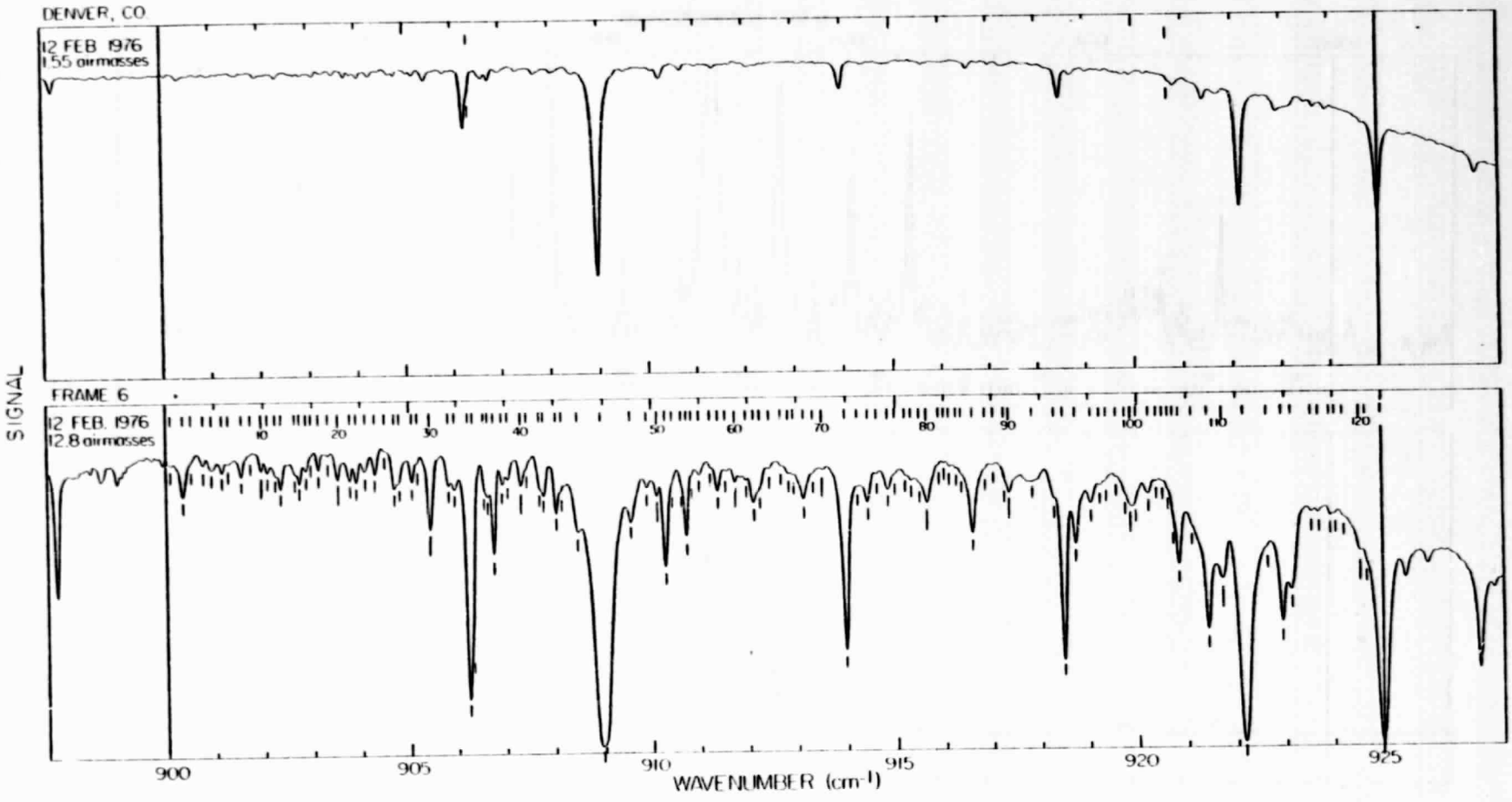
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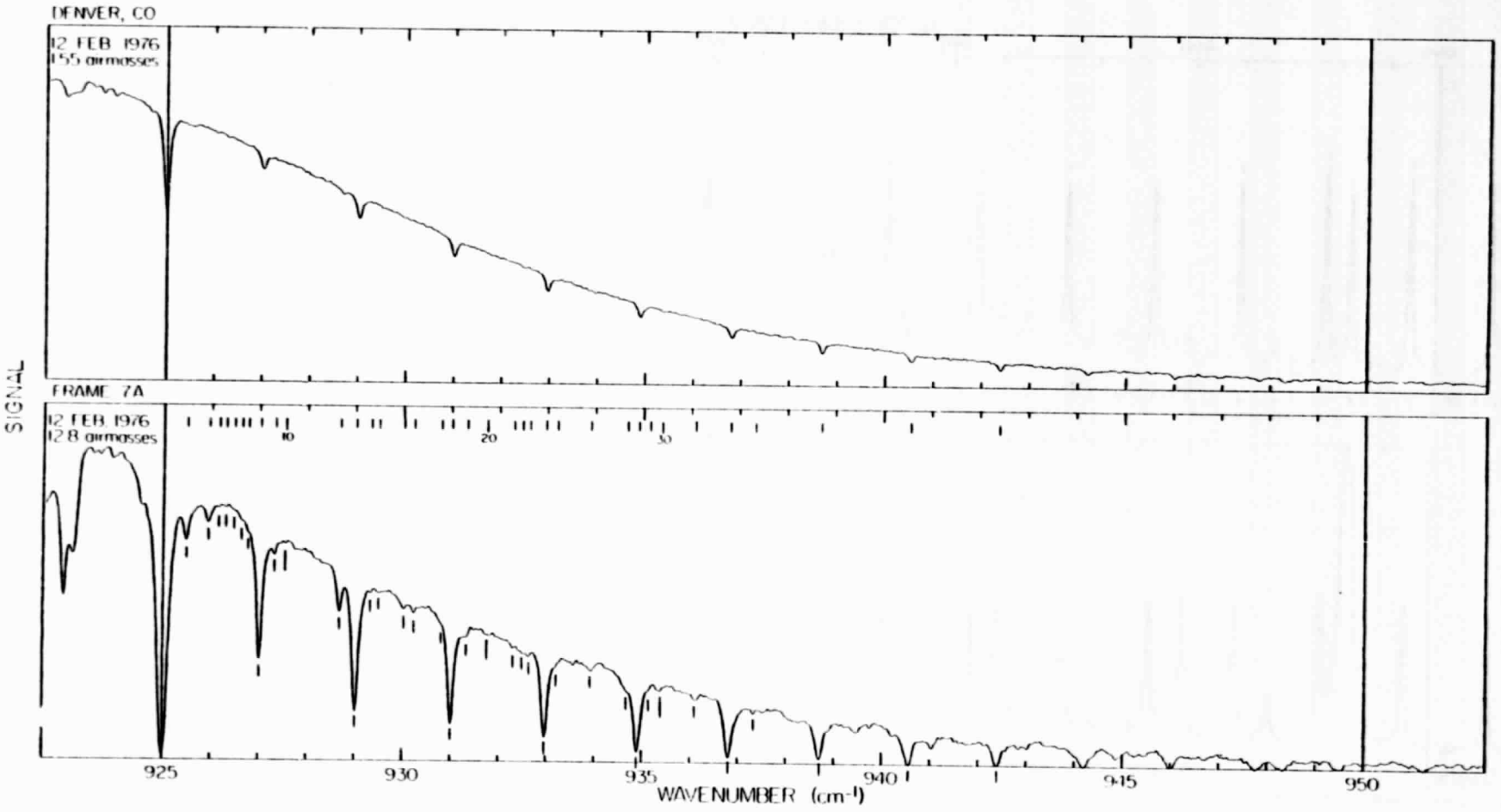
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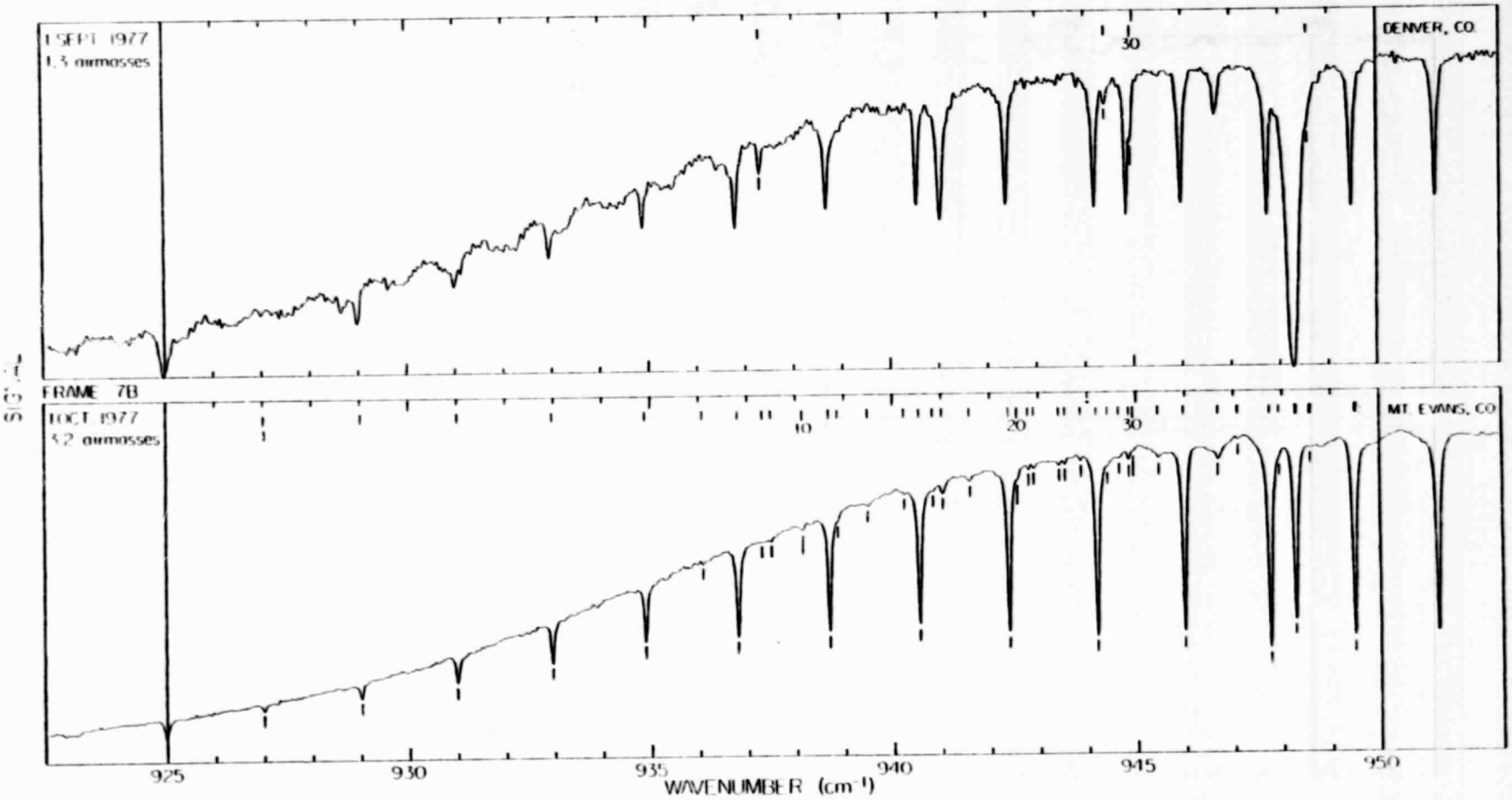
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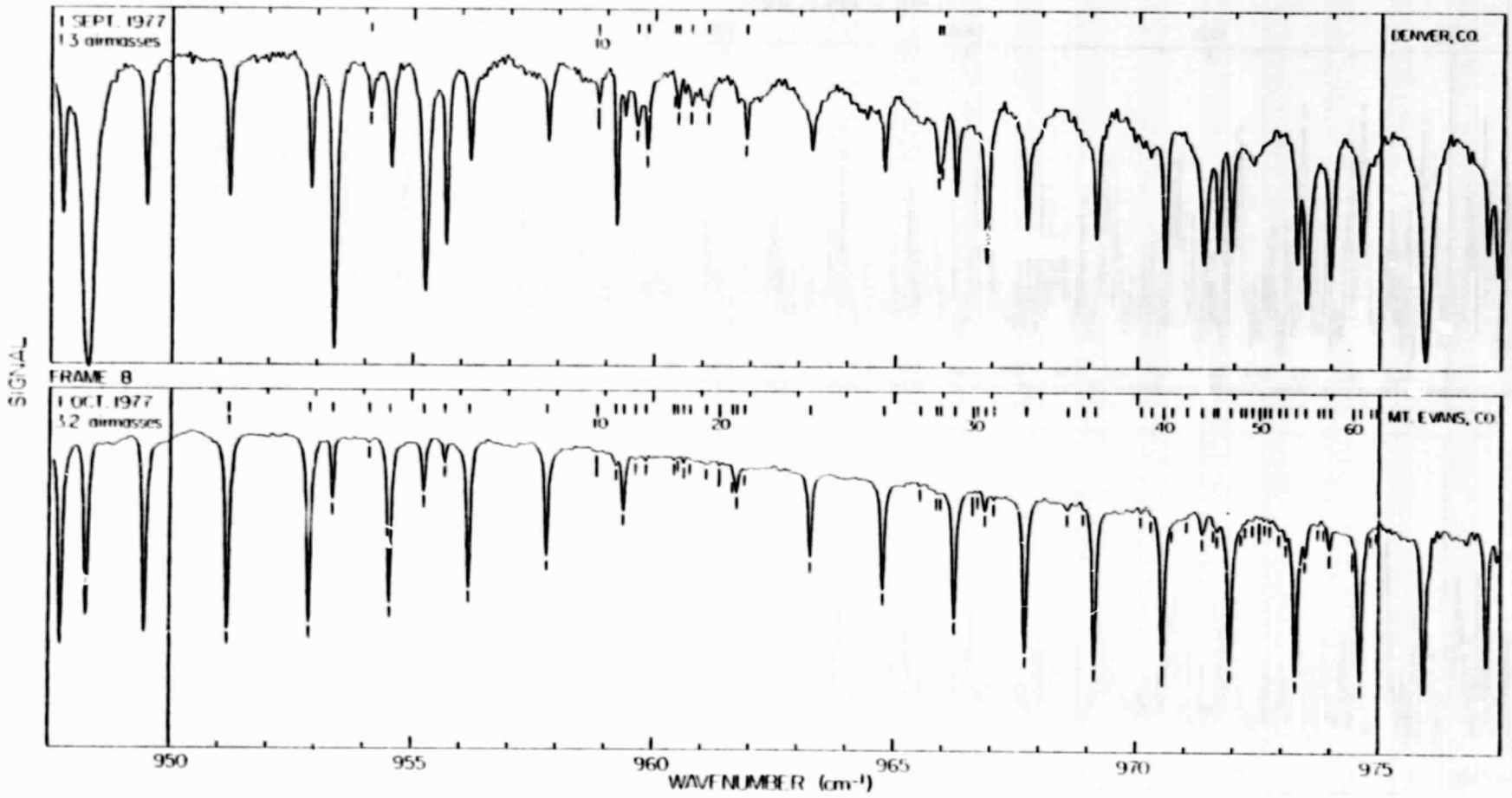
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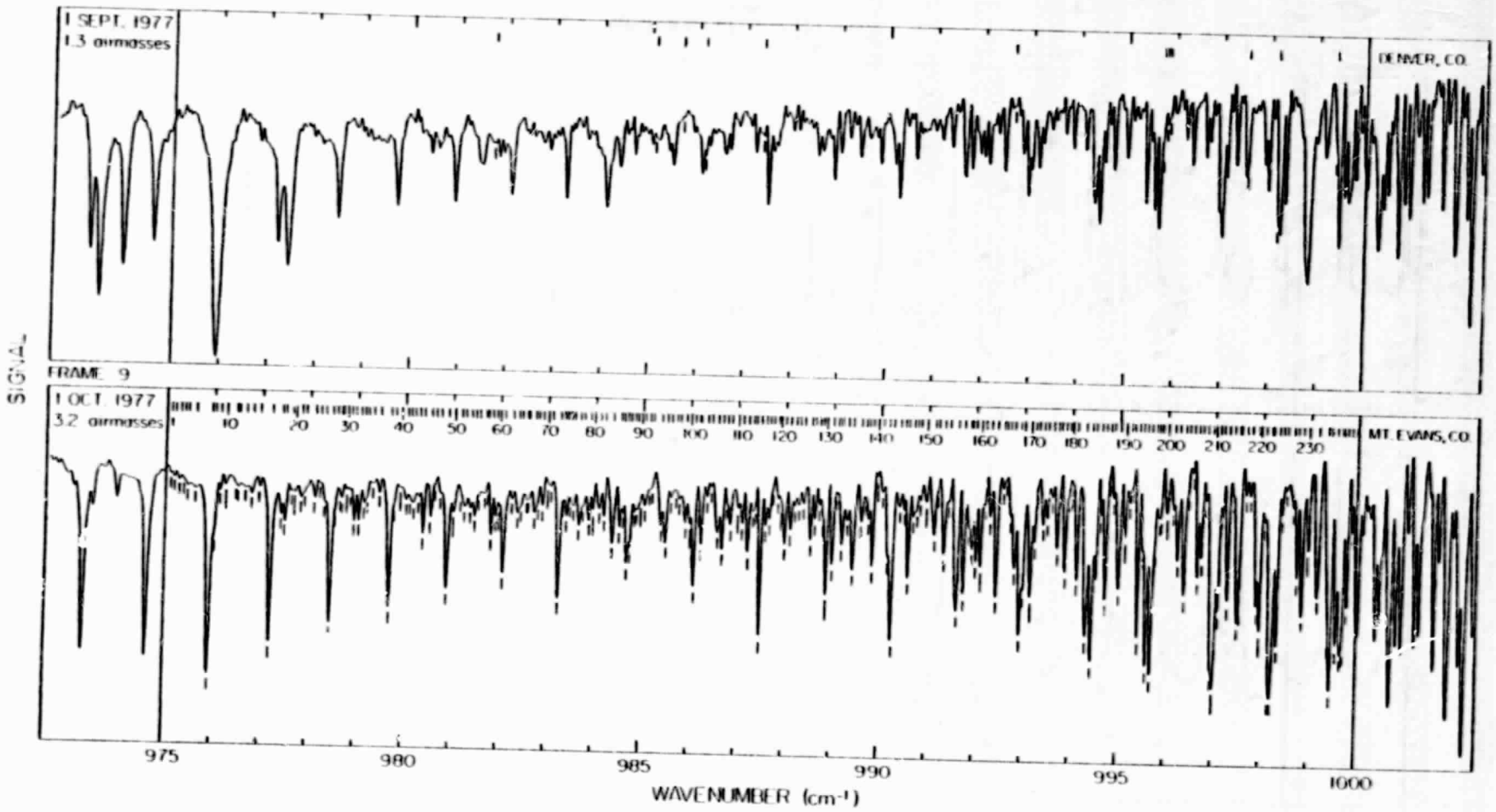
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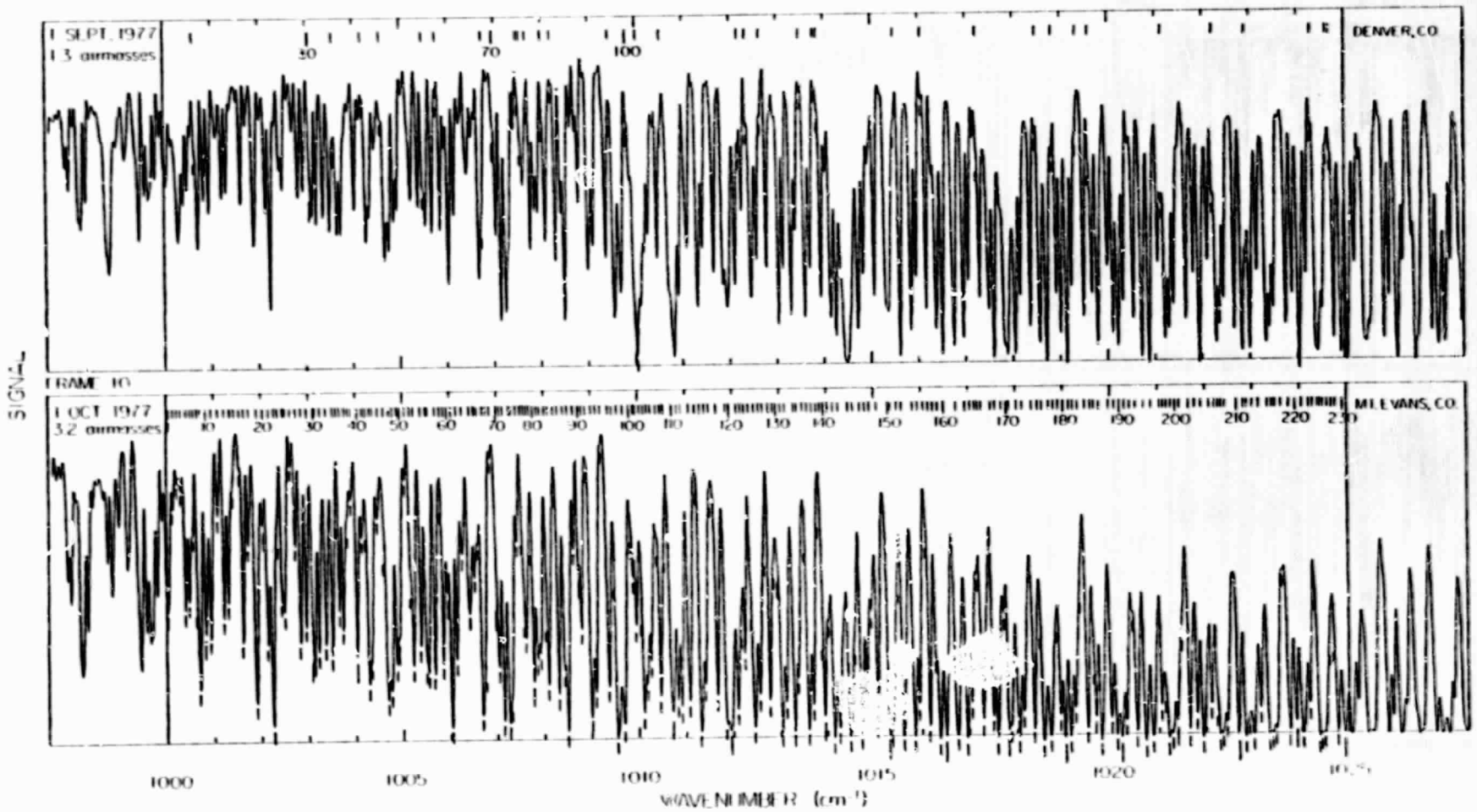
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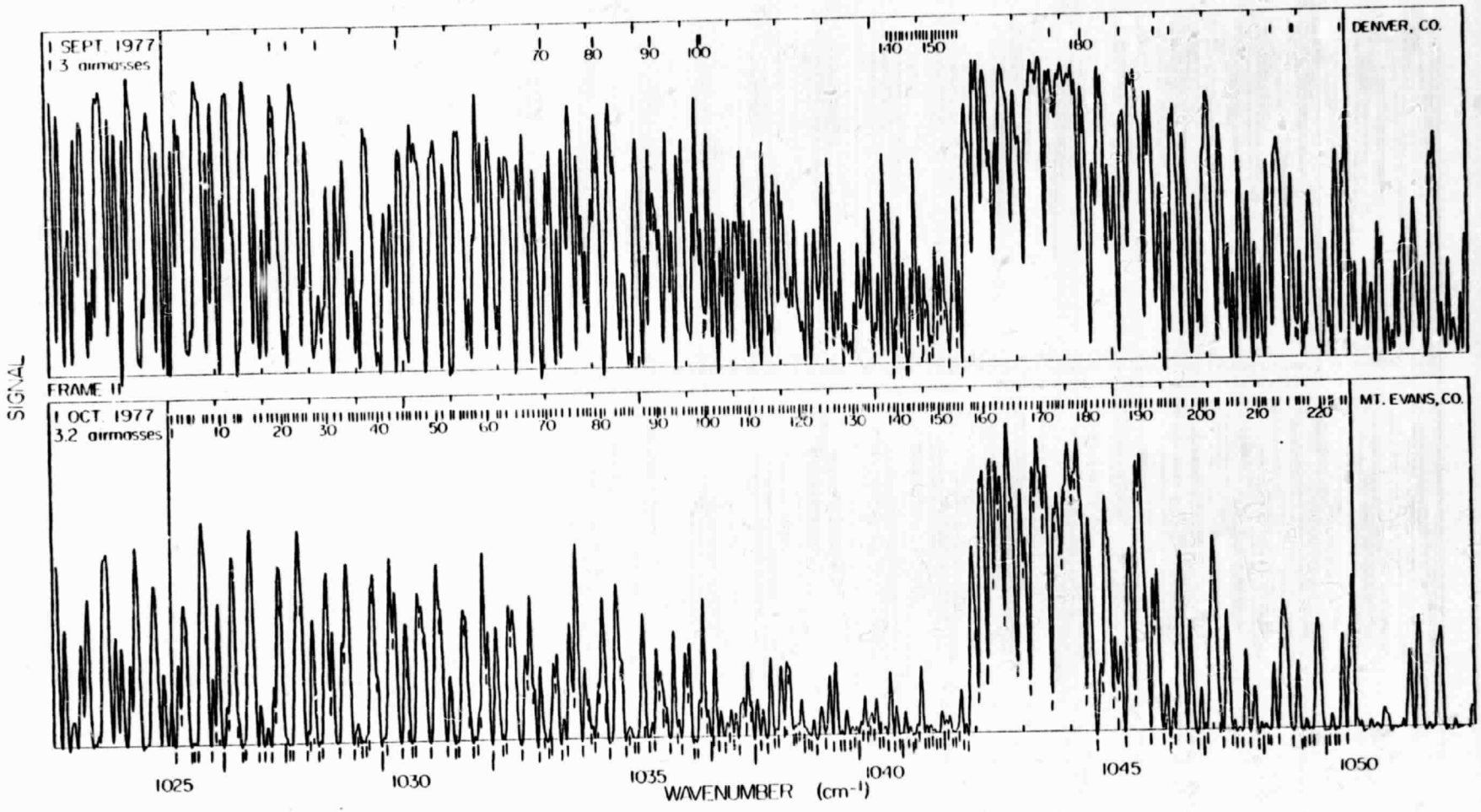
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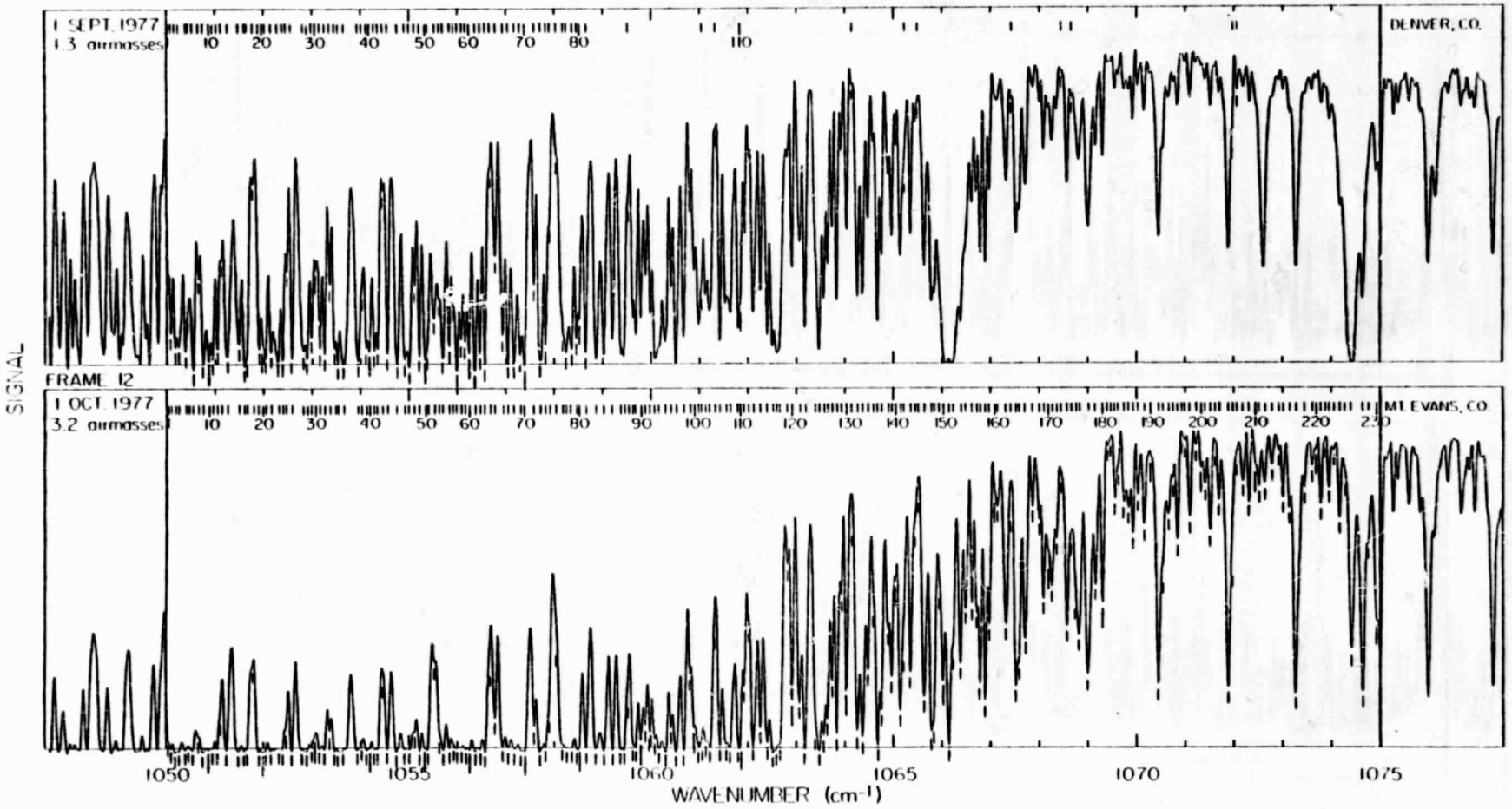
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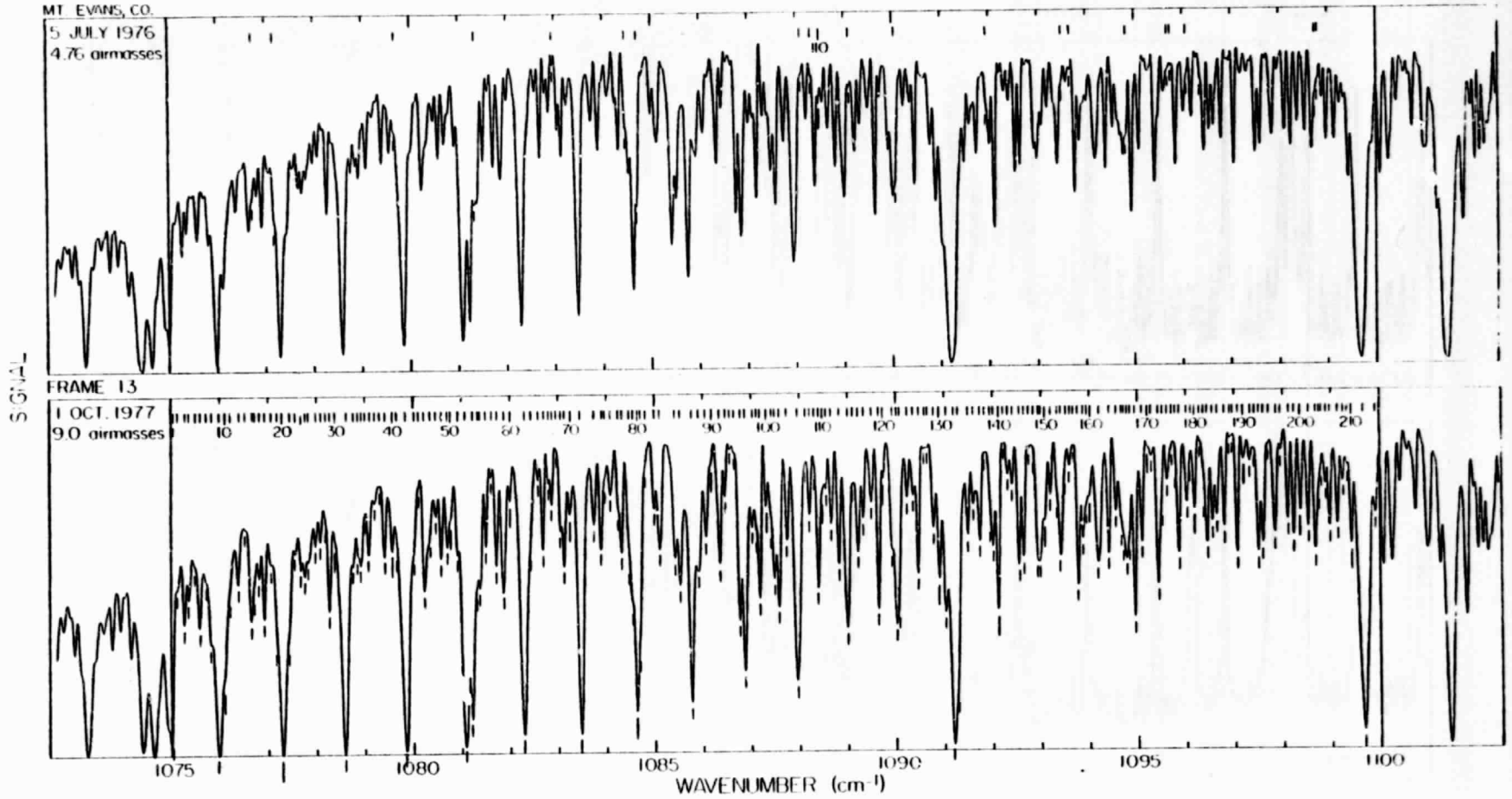
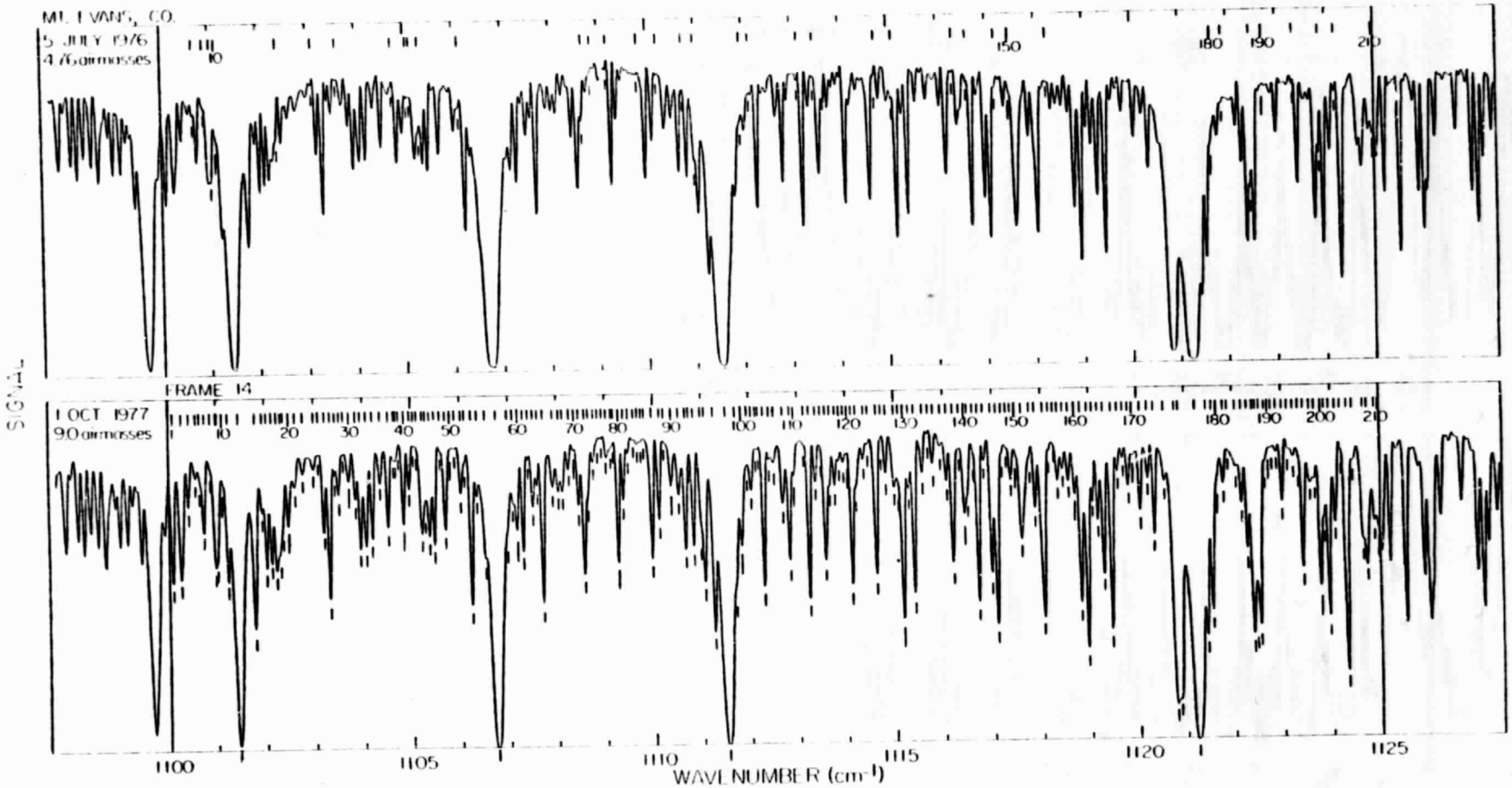
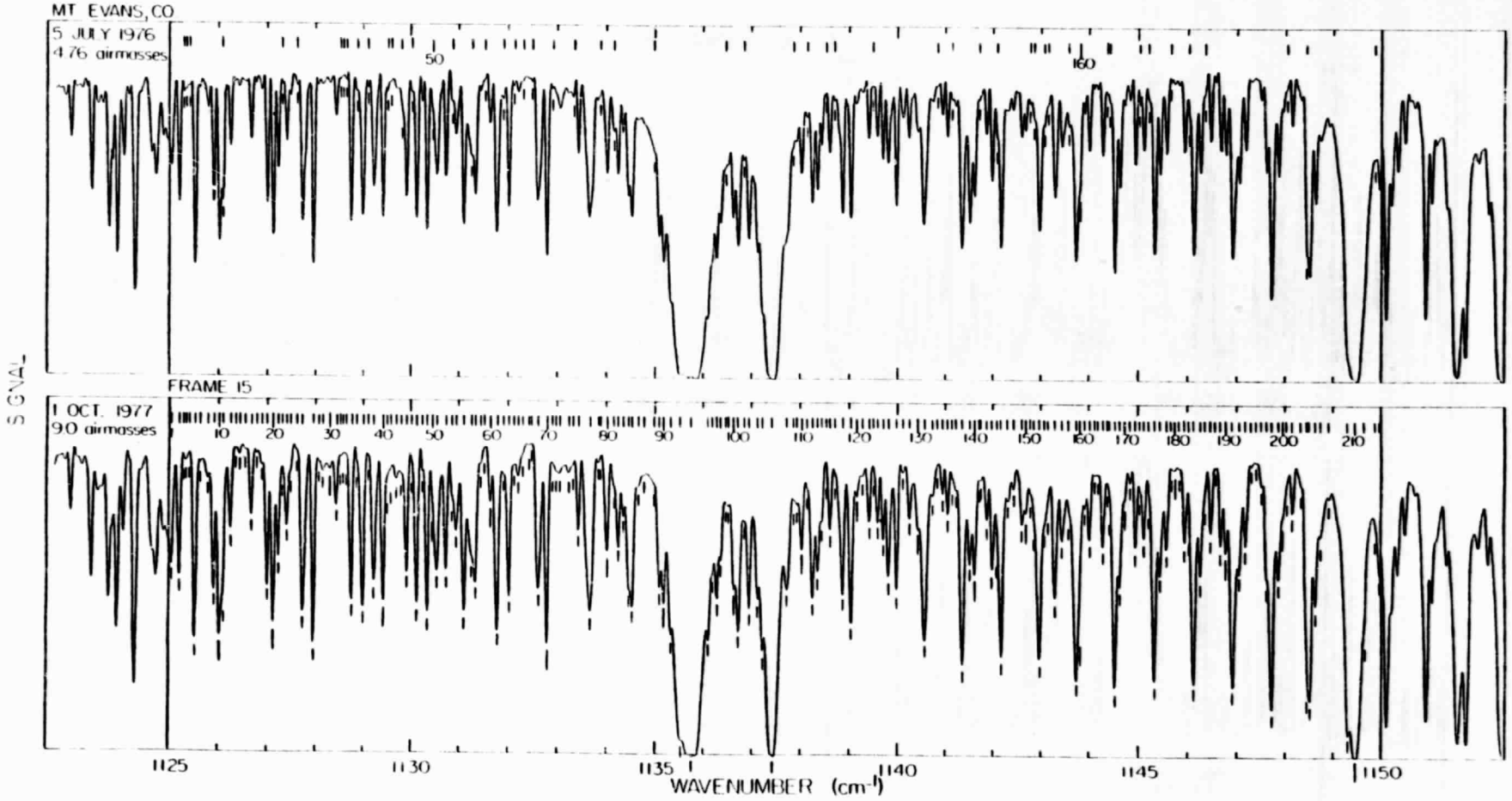
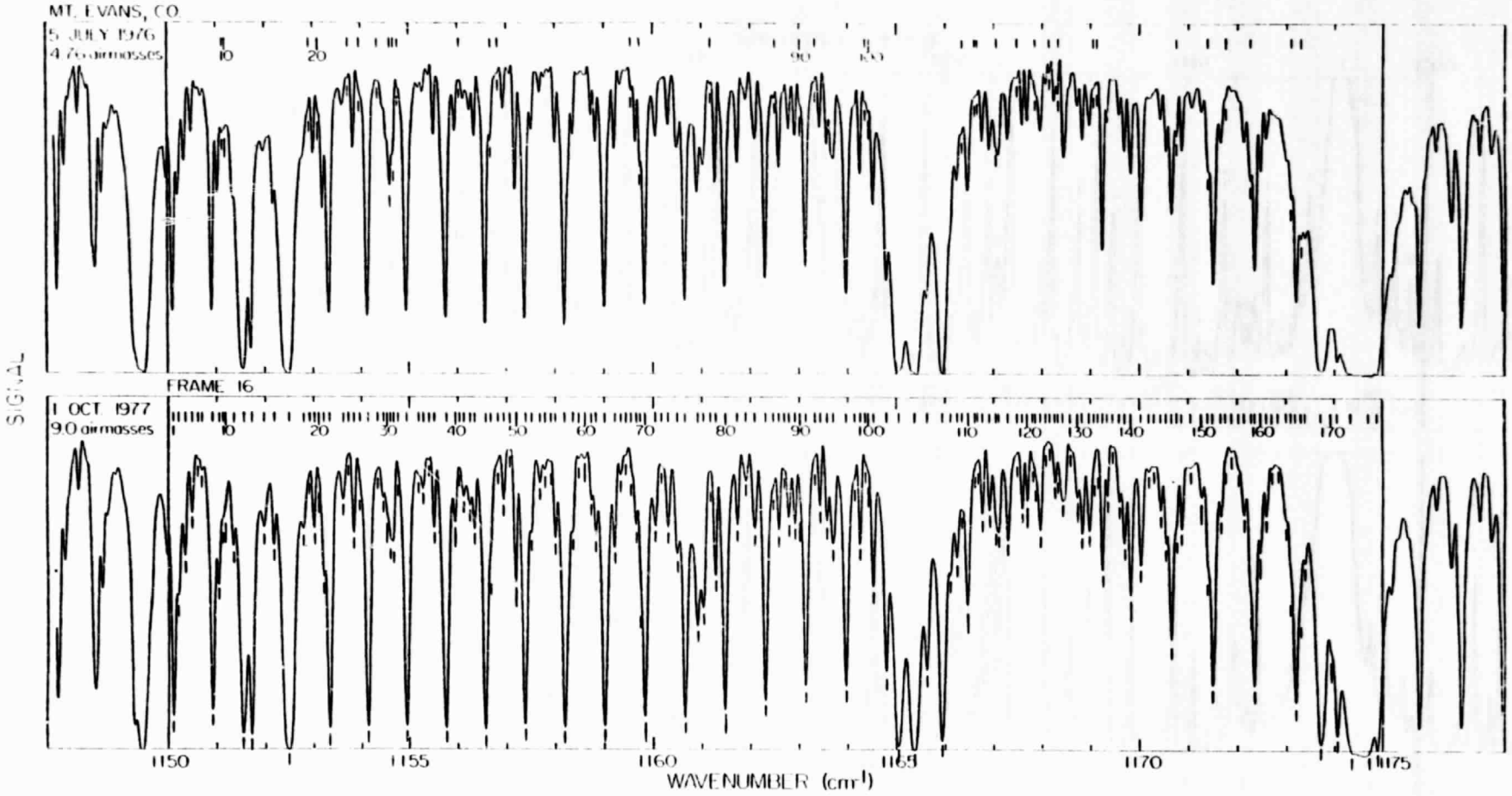
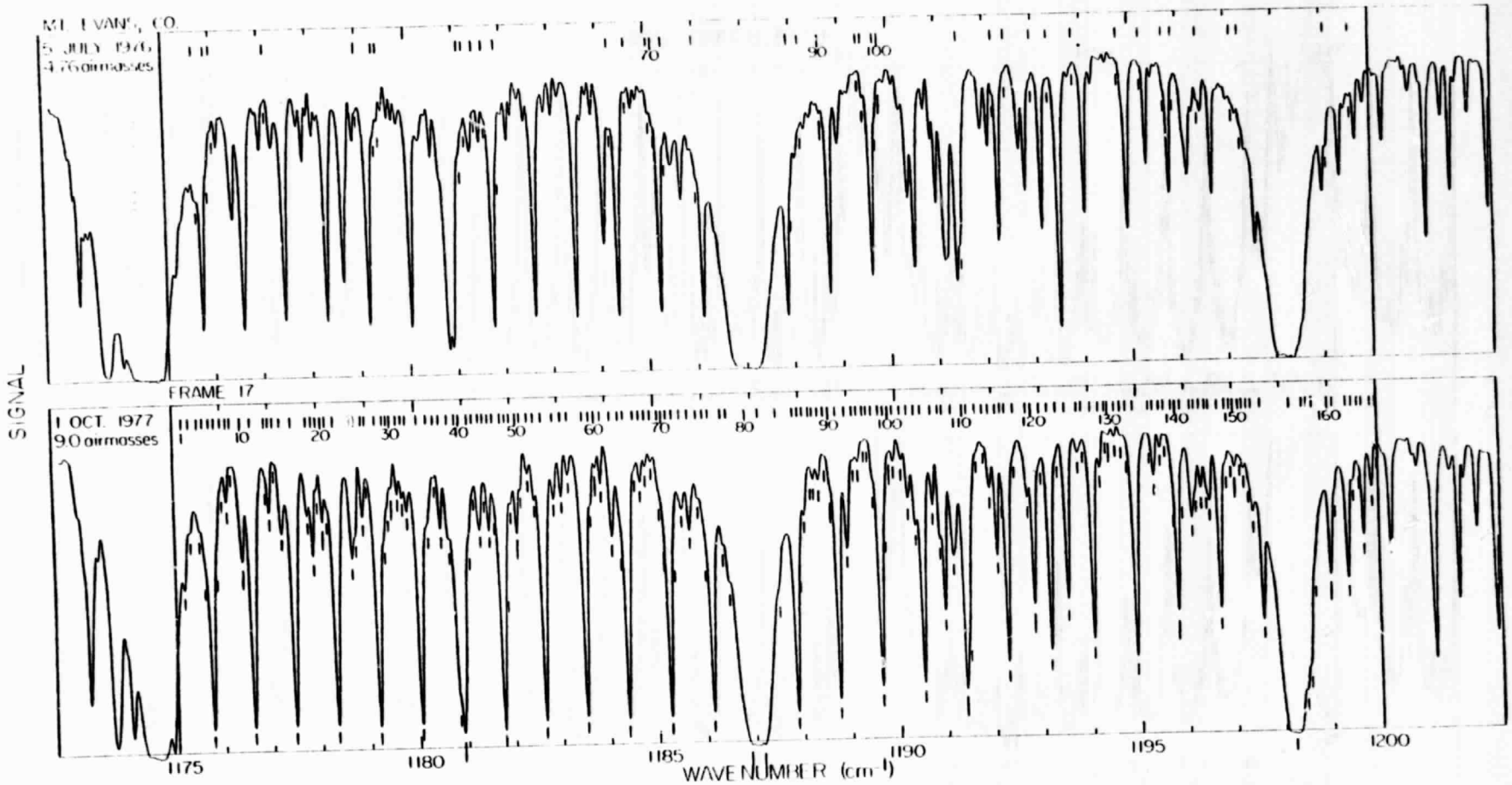
1075
WAVENUMBER (cm⁻¹)

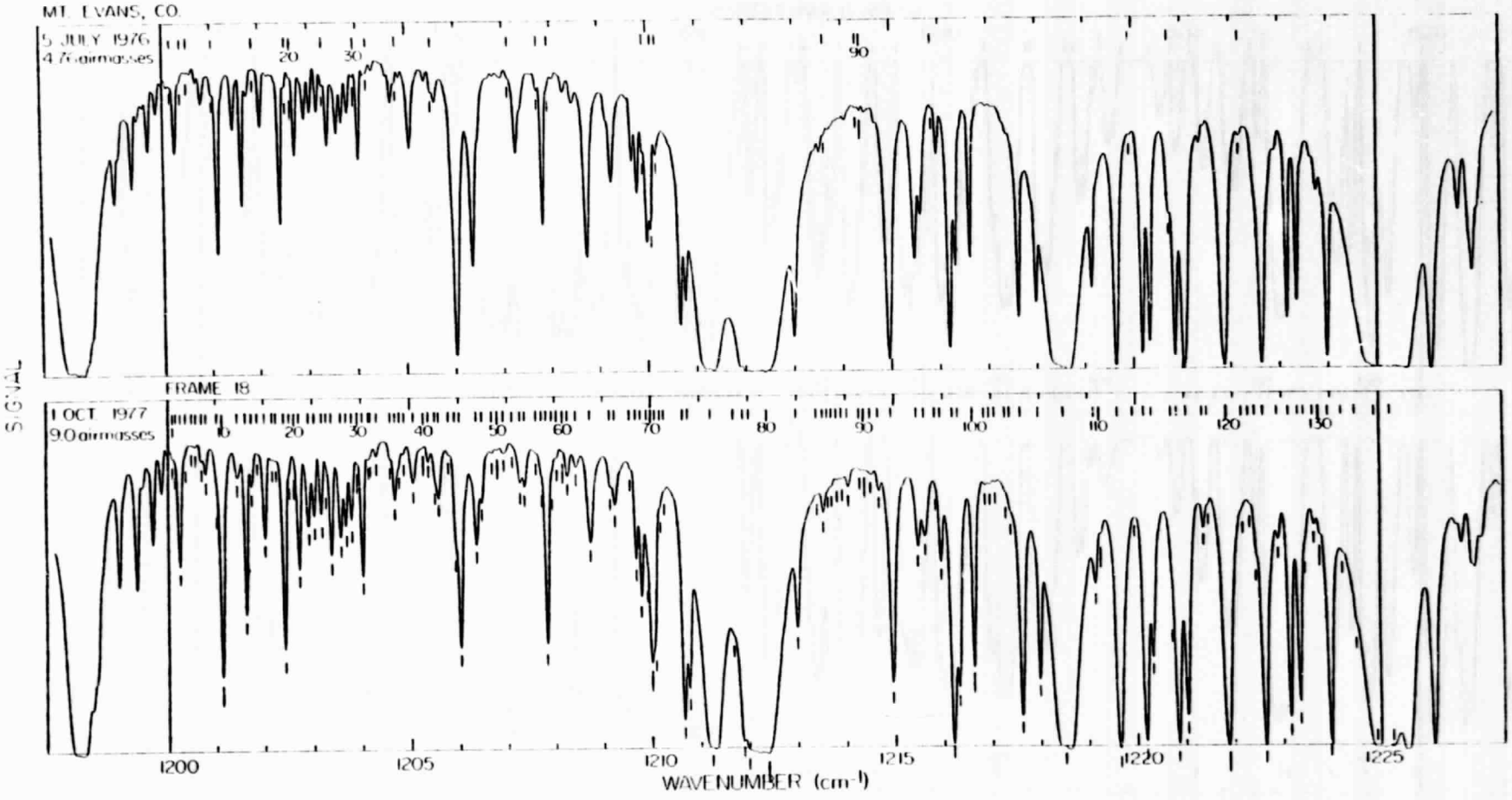

MT. EVANS, CO.
5 JULY 1976
4.76 airmasses
FRAME 13
1 OCT. 1977
9.0 airmasses
SIGNAL
1075
1080
1085
1090
1095
1100
WAVENUMBER (cm⁻¹)

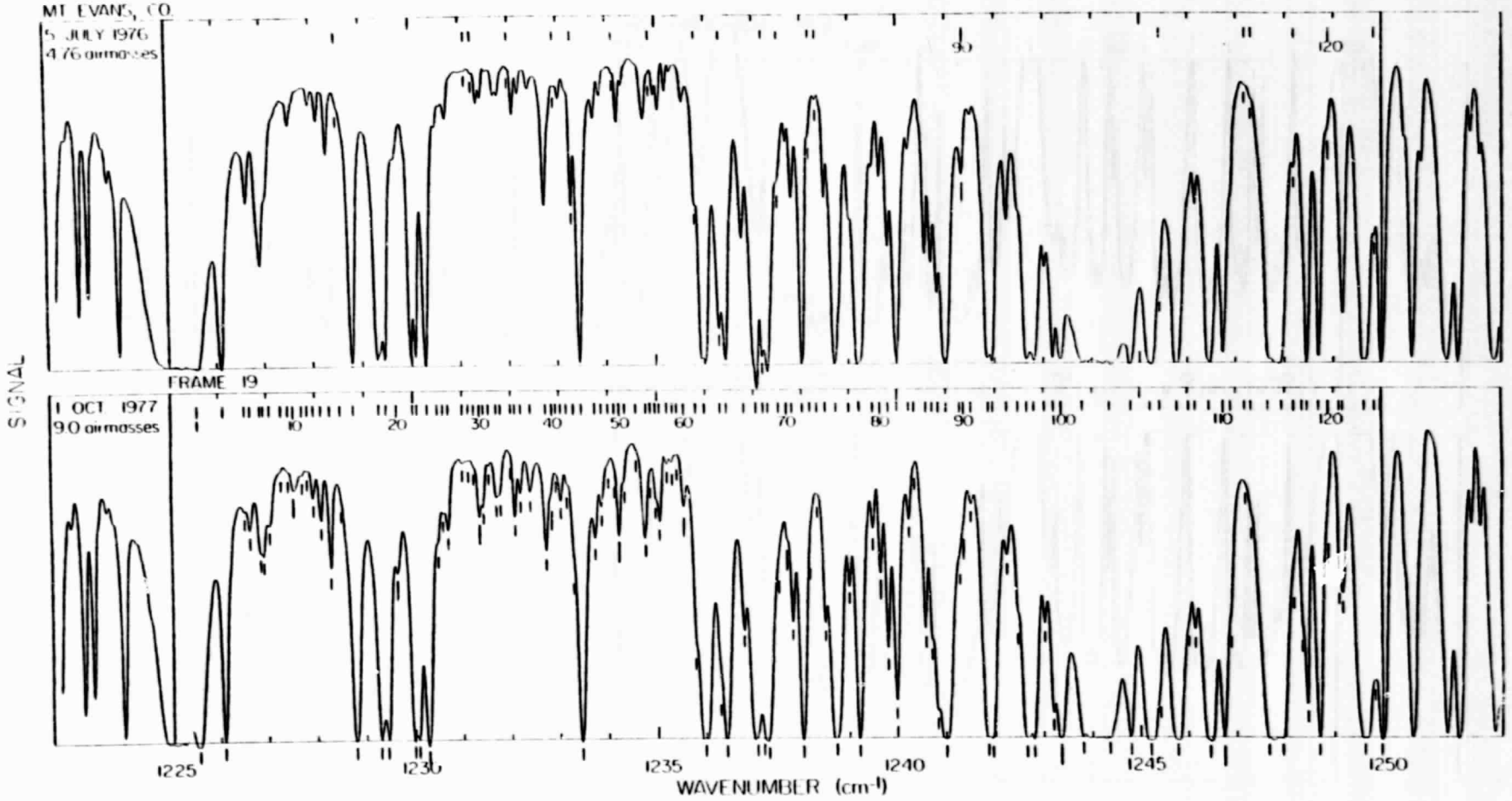

MT. EVANS, CO.
5 JULY 1976
476 airmasses
10
150
180
190
200
FRAME 14
1 OCT 1977
90 airmasses
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
210
SIGNAL
1100
1105
1110
1115
1120
1125
WAVENUMBER (cm-1)

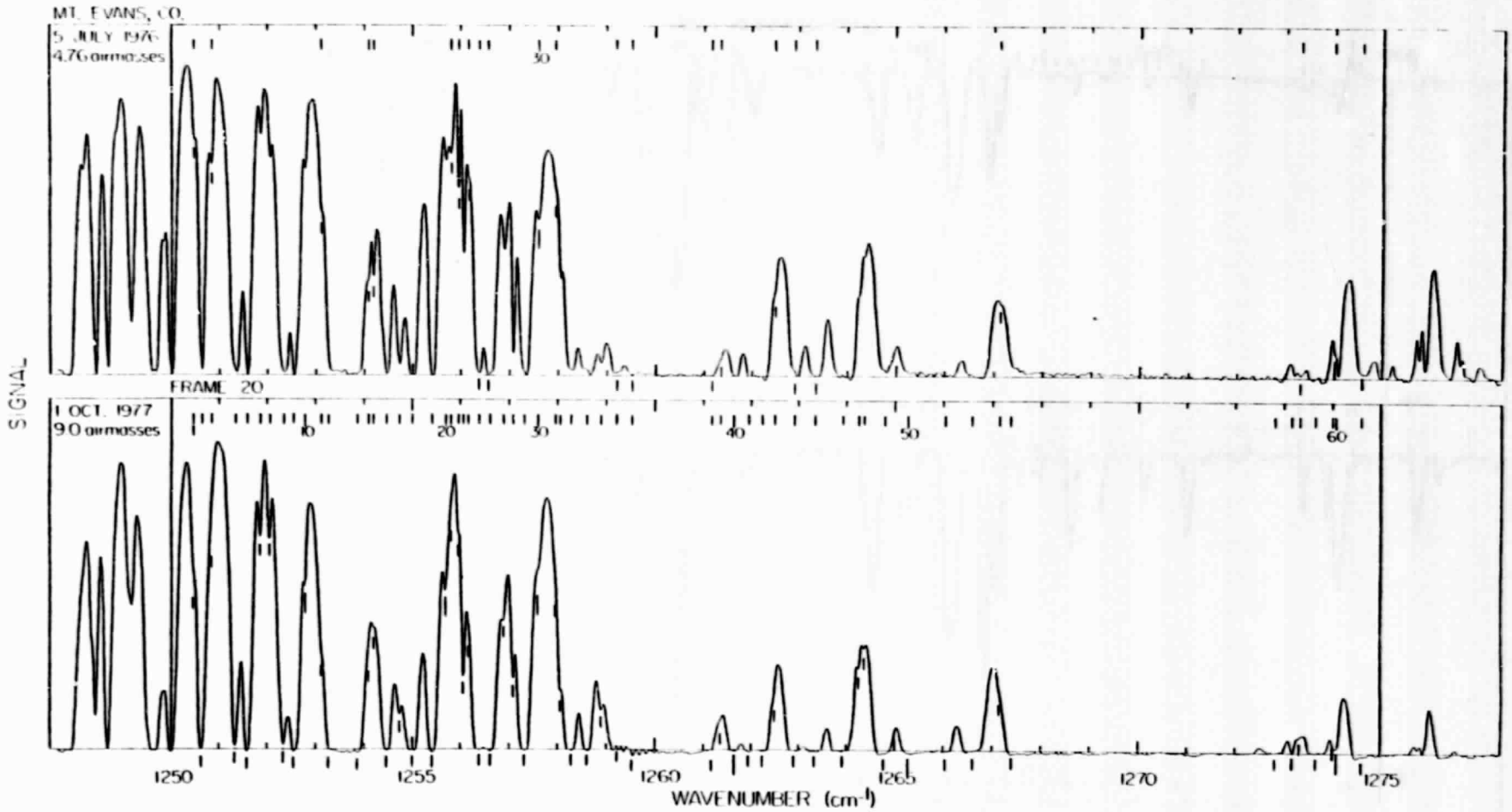

MT. EVANS, CO
5 JULY 1976
4.76 airmasses
50
160
FRAME 15
1 OCT. 1977
9.0 airmasses
10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210
SIGNAL
1125
1130
1135
1140
1145
1150
WAVENUMBER (cm-1)

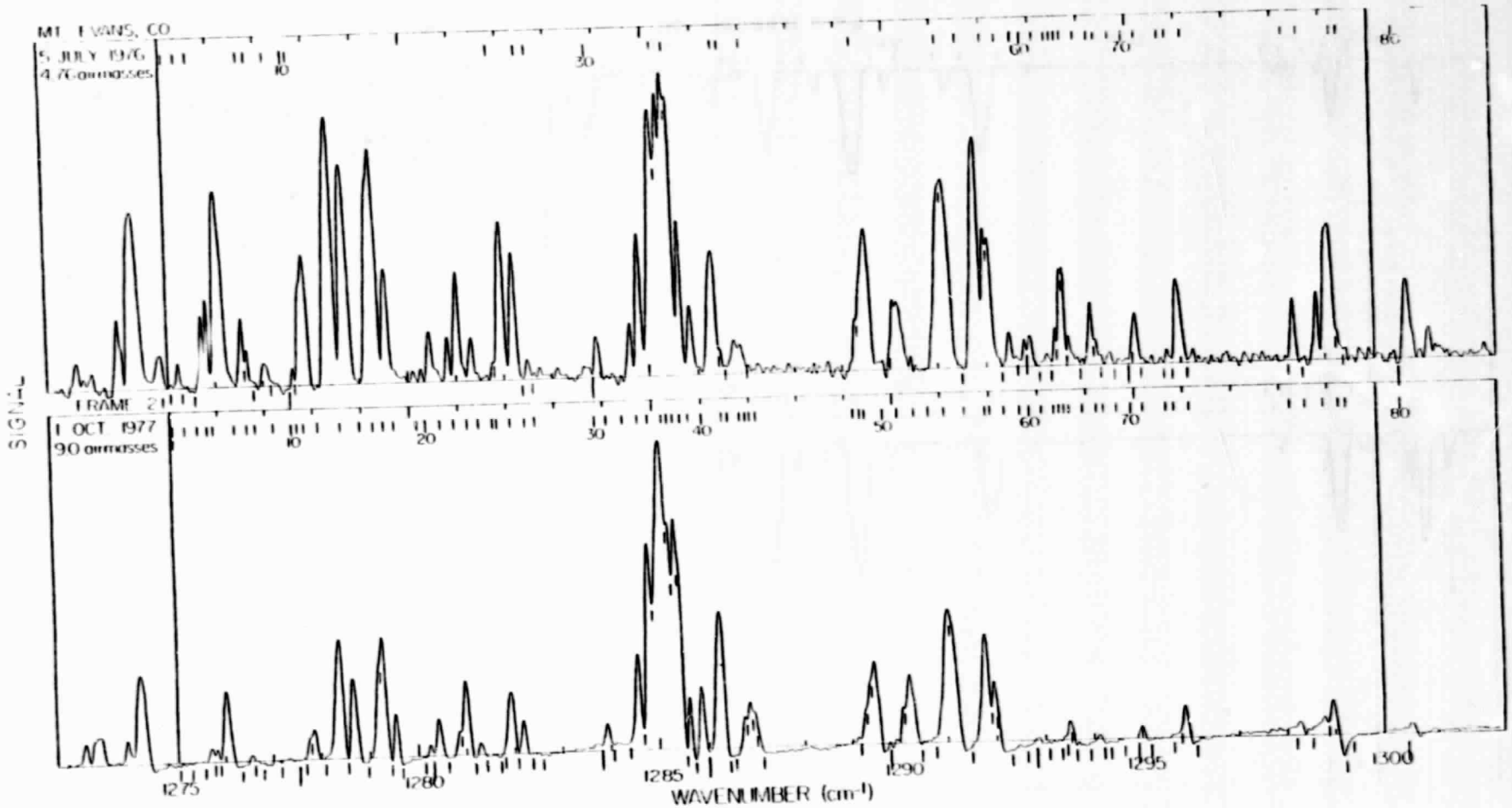

MT. EVANS, CO
5 JULY 1976
4.7 airmasses
FRAME 16
1 OCT. 1977
9.0 airmasses
SIGNAL
1150
1155
1160
1165
1170
1175
WAVENUMBER (cm⁻¹)

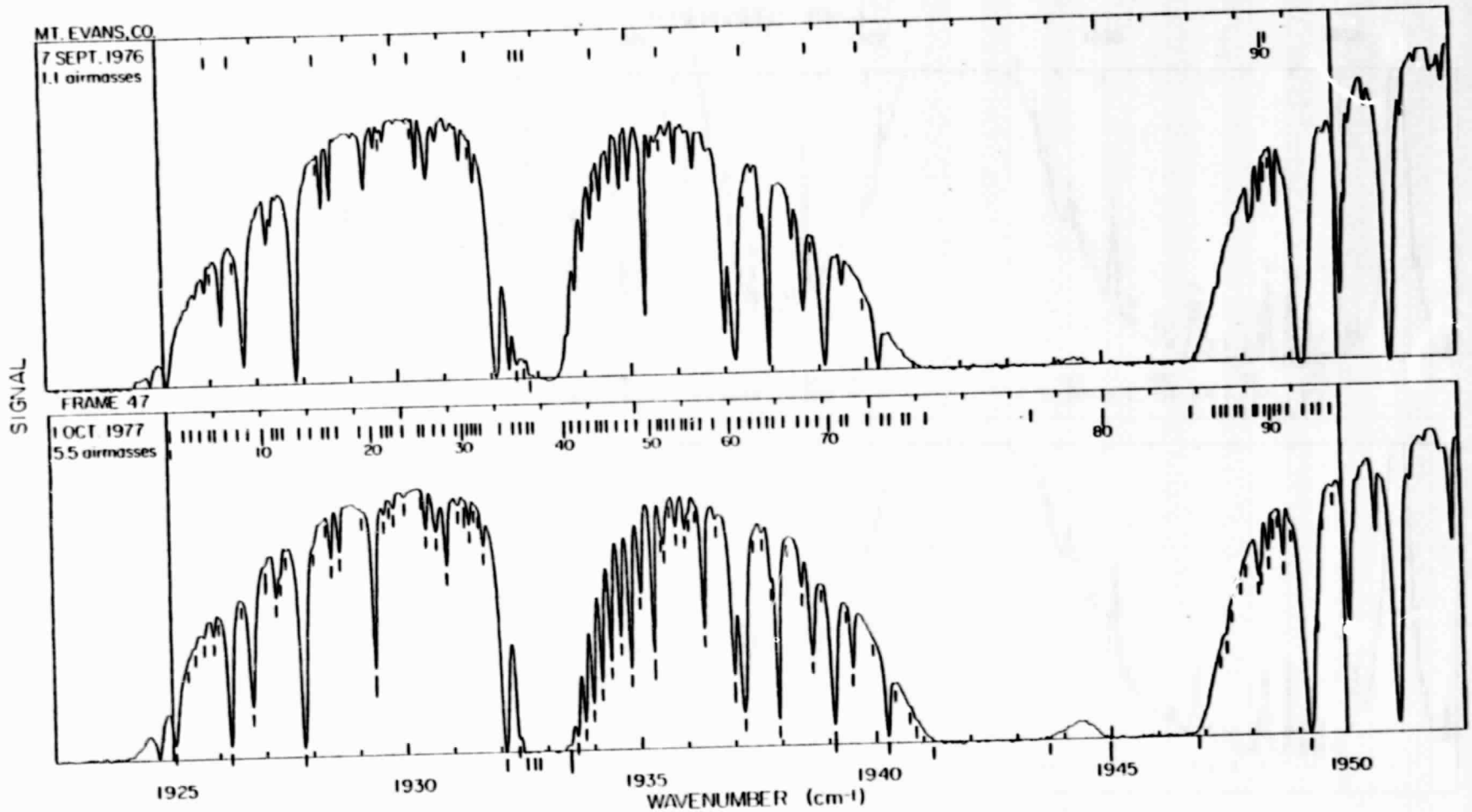

MT. EVANS, CO.
5 JULY 1976
4.76 airmasses
FRAME 17
1 OCT. 1977
9.0 airmasses
SIGNAL
WAVE NUMBER (cm⁻¹)
1175
1180
1185
1190
1195
1200

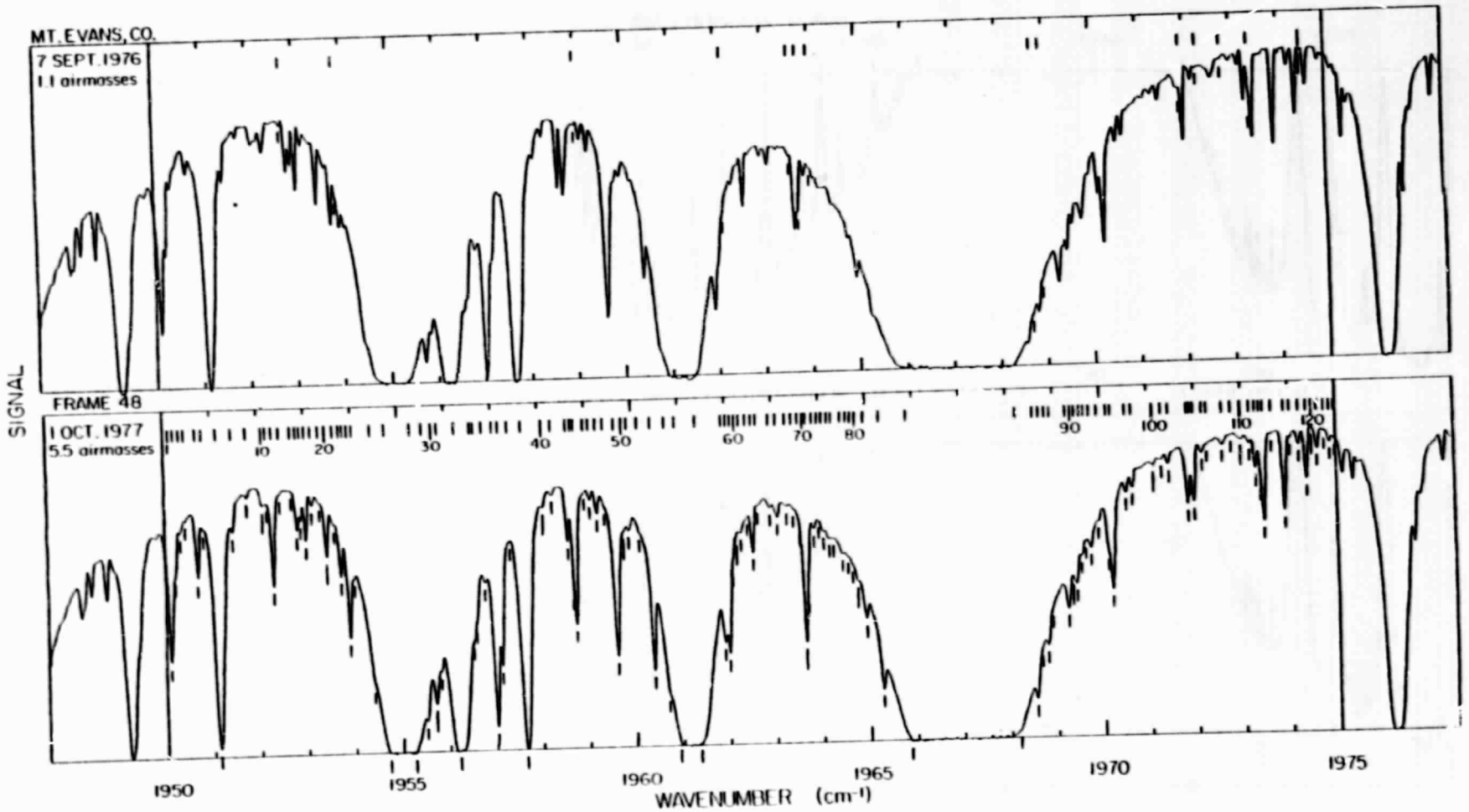

MT. EVANS, CO.
5 JULY 1976
4.7 airmasses
FRAME 18
1 OCT. 1977
9.0 airmasses
SIGNAL
1200
1205
1210
1215
1220
1225
WAVENUMBER (cm-1)

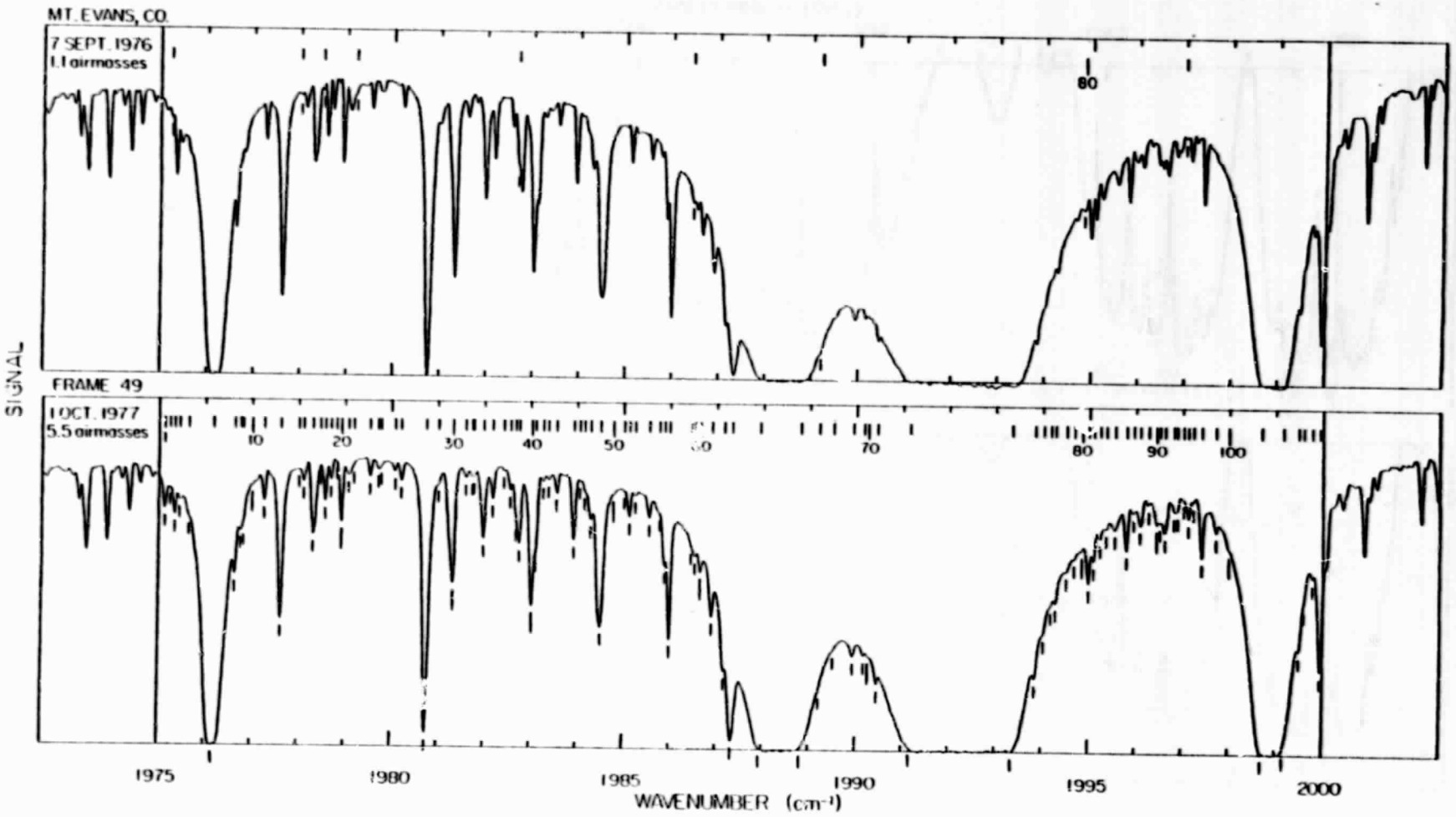

MT EVANS, CO
5 JULY 1976
4.76 airmasses
FRAME 19
1 OCT 1977
9.0 airmasses
SIGNAL
1225
1230
1235
1240
1245
1250
WAVENUMBER (cm-1)

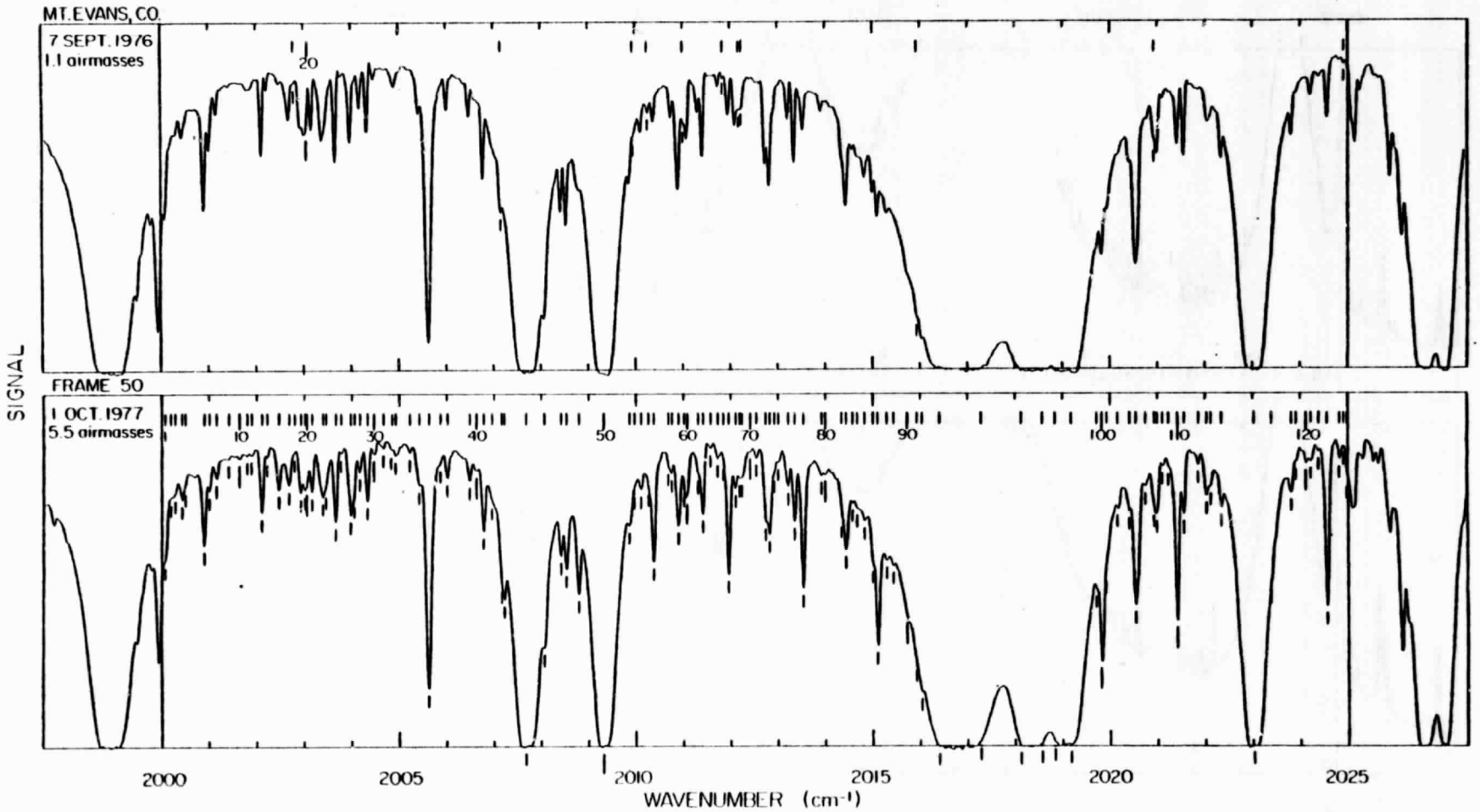

MT. EVANS, CO.
5 JULY 1976
4.76 airmasses
FRAME 20
1 OCT. 1977
9.0 airmasses
SIGNAL
1250
1255
1260
1265
1270
1275
WAVENUMBER (cm⁻¹)

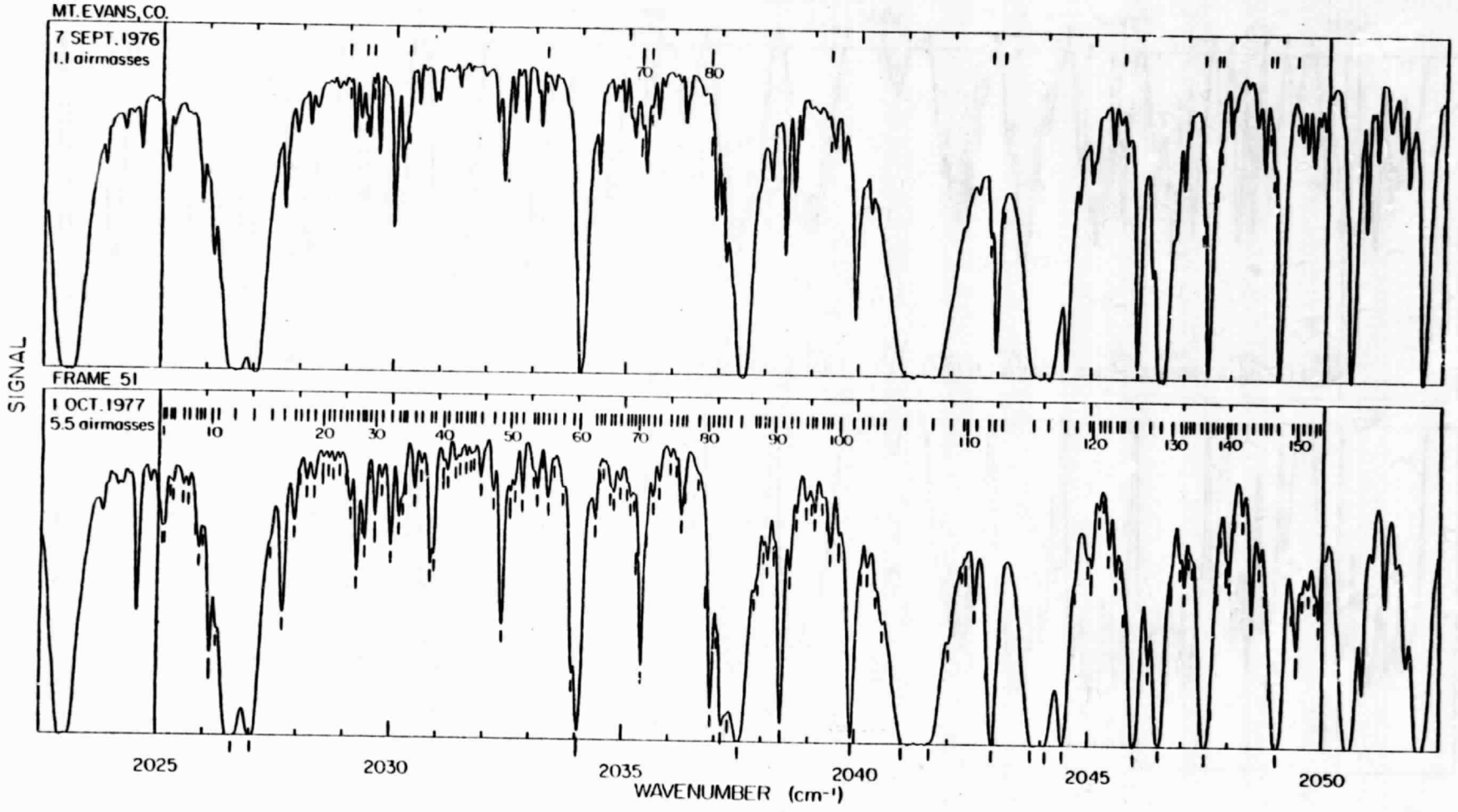

MT EVANS, CO
5 JULY 1976
47 coadds
FRAME 2
1 OCT 1977
90 coadds
SIGNAL
10
30
60
70
80
20
40
50
1275
1280
1285
1290
1295
1300
WAVENUMBER (cm-1)

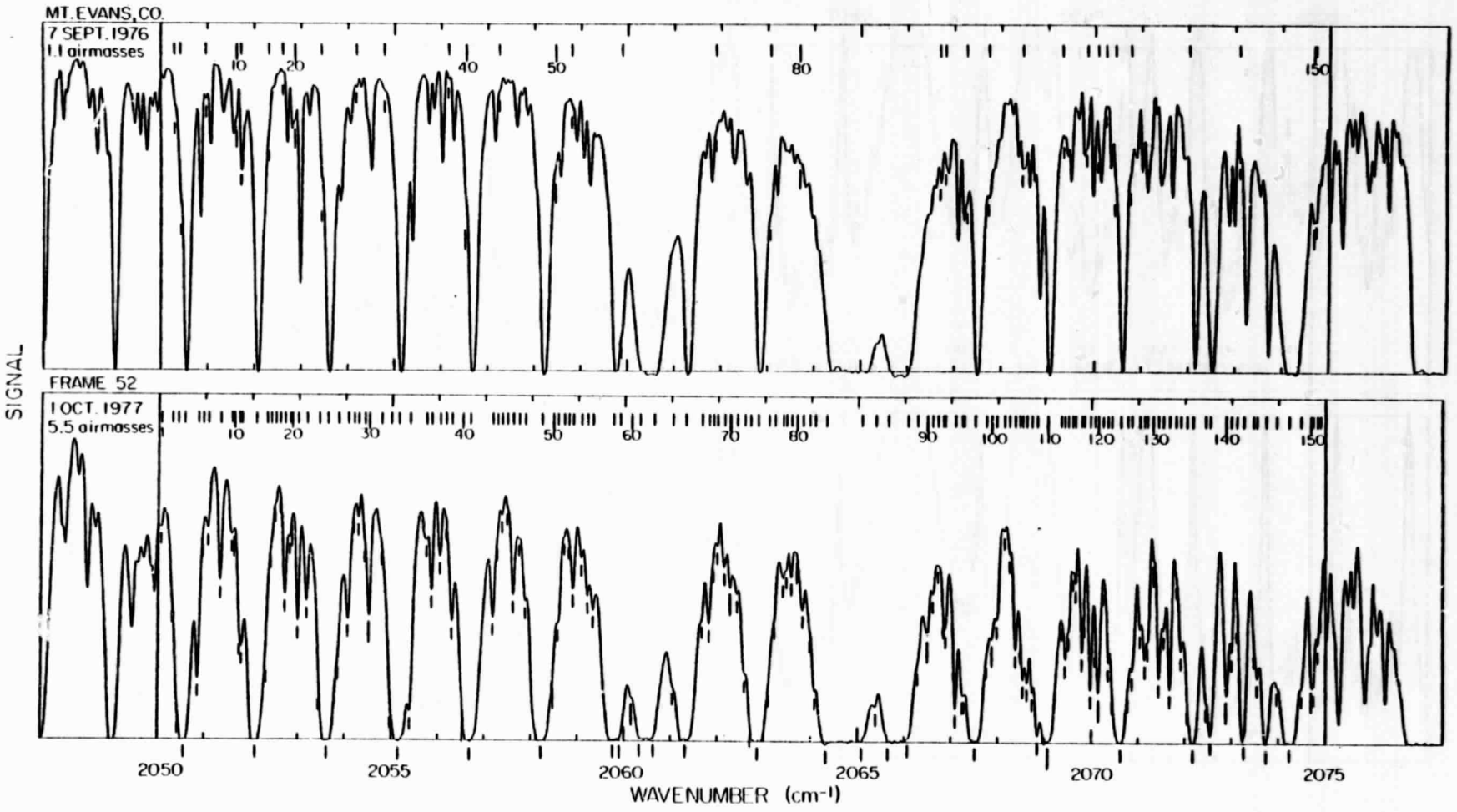

MT. EVANS, CO.
7 SEPT. 1976
1.1 airmasses
90
FRAME 47
1 OCT. 1977
5.5 airmasses
10
20
30
40
50
60
70
80
90
SIGNAL
1925
1930
1935
1940
1945
1950
WAVENUMBER (cm-1)

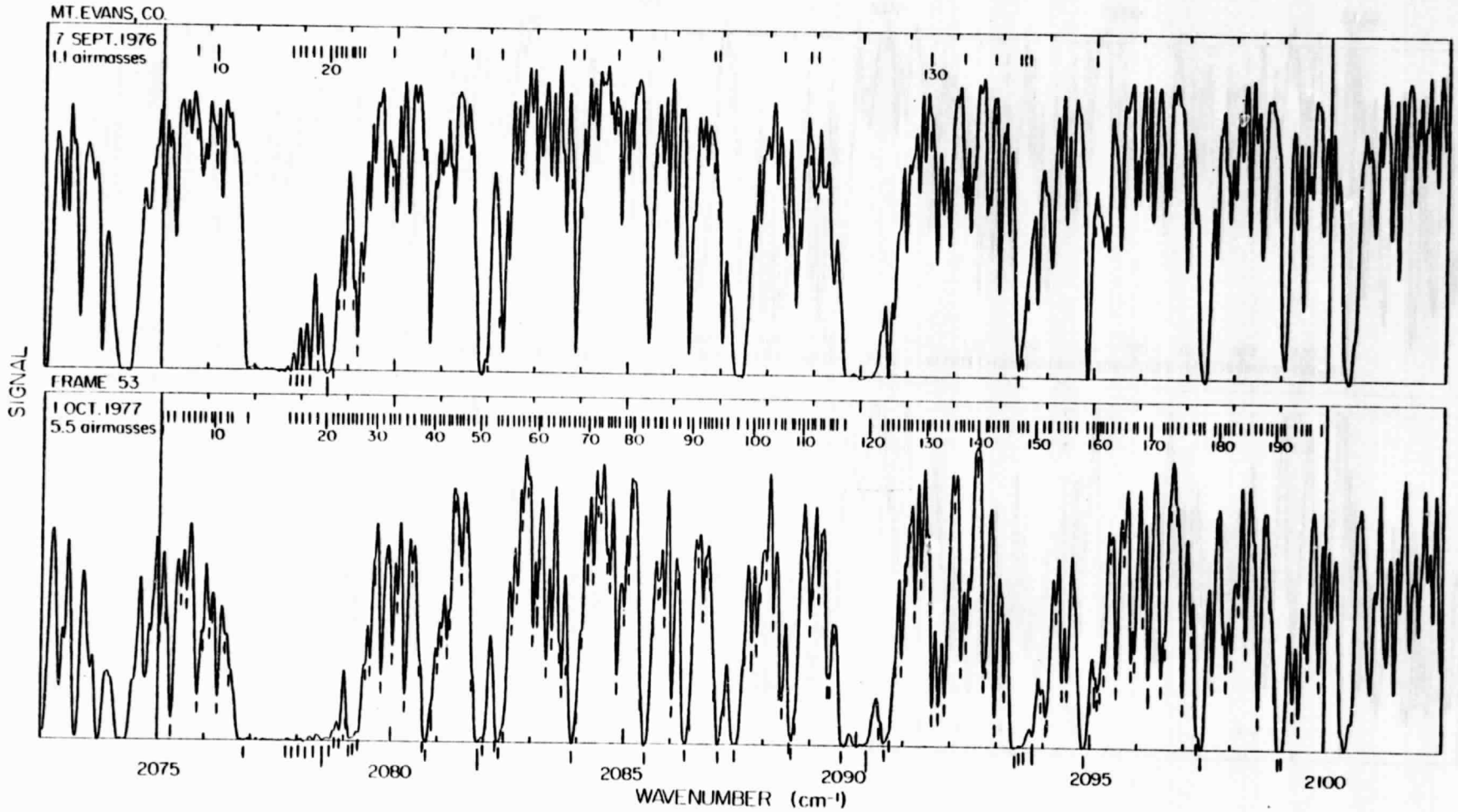

MT. EVANS, CO.
7 SEPT. 1976
1.1 airmasses
FRAME 48
1 OCT. 1977
5.5 airmasses
SIGNAL
10
20
30
40
50
60
70
80
90
100
110
120
1950
1955
1960
1965
1970
1975
WAVENUMBER (cm-1)

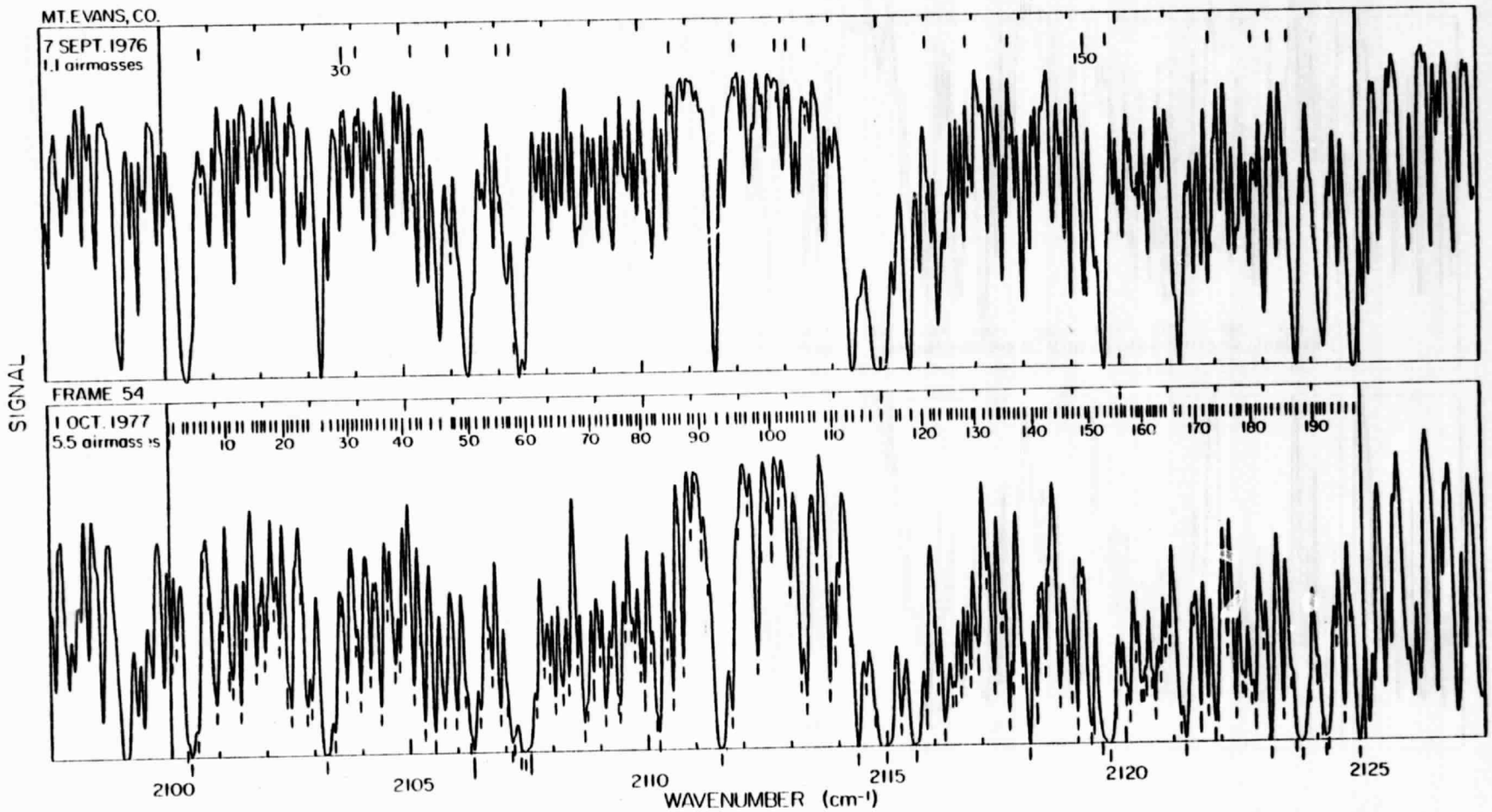

MT. EVANS, CO
7 SEPT. 1976
1.1 airmasses
FRAME 49
1 OCT. 1977
5.5 airmasses
SIGNAL
10
20
30
40
50
70
80
90
100
1975
1980
1985
1990
1995
2000
WAVENUMBER (cm⁻¹)

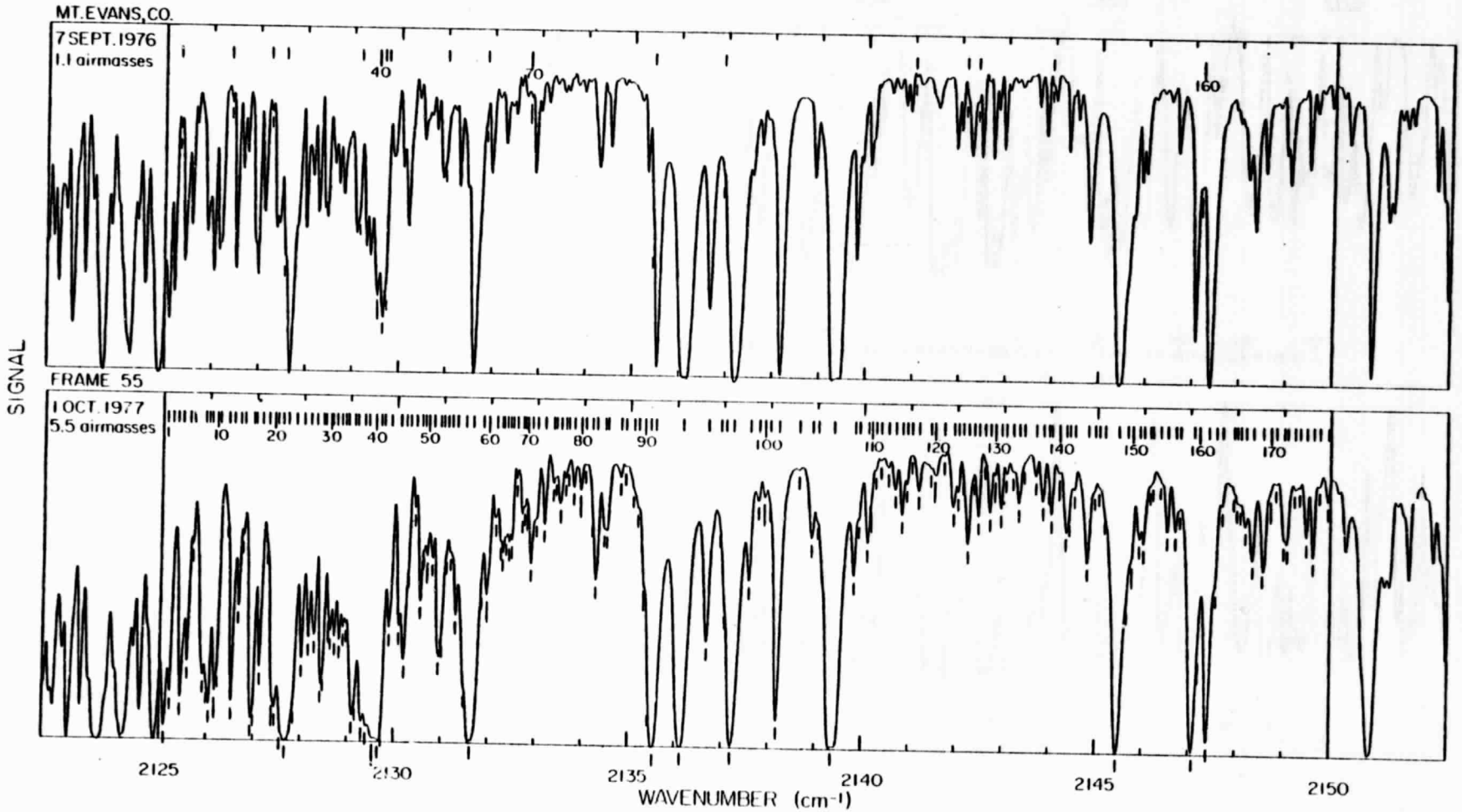

MT. EVANS, CO.
7 SEPT. 1976
1.1 airmasses
20
FRAME 50
1 OCT. 1977
5.5 airmasses
10
20
30
40
50
60
70
80
90
100
110
120
SIGNAL
2000
2005
2010
2015
2020
2025
WAVENUMBER (cm⁻¹)

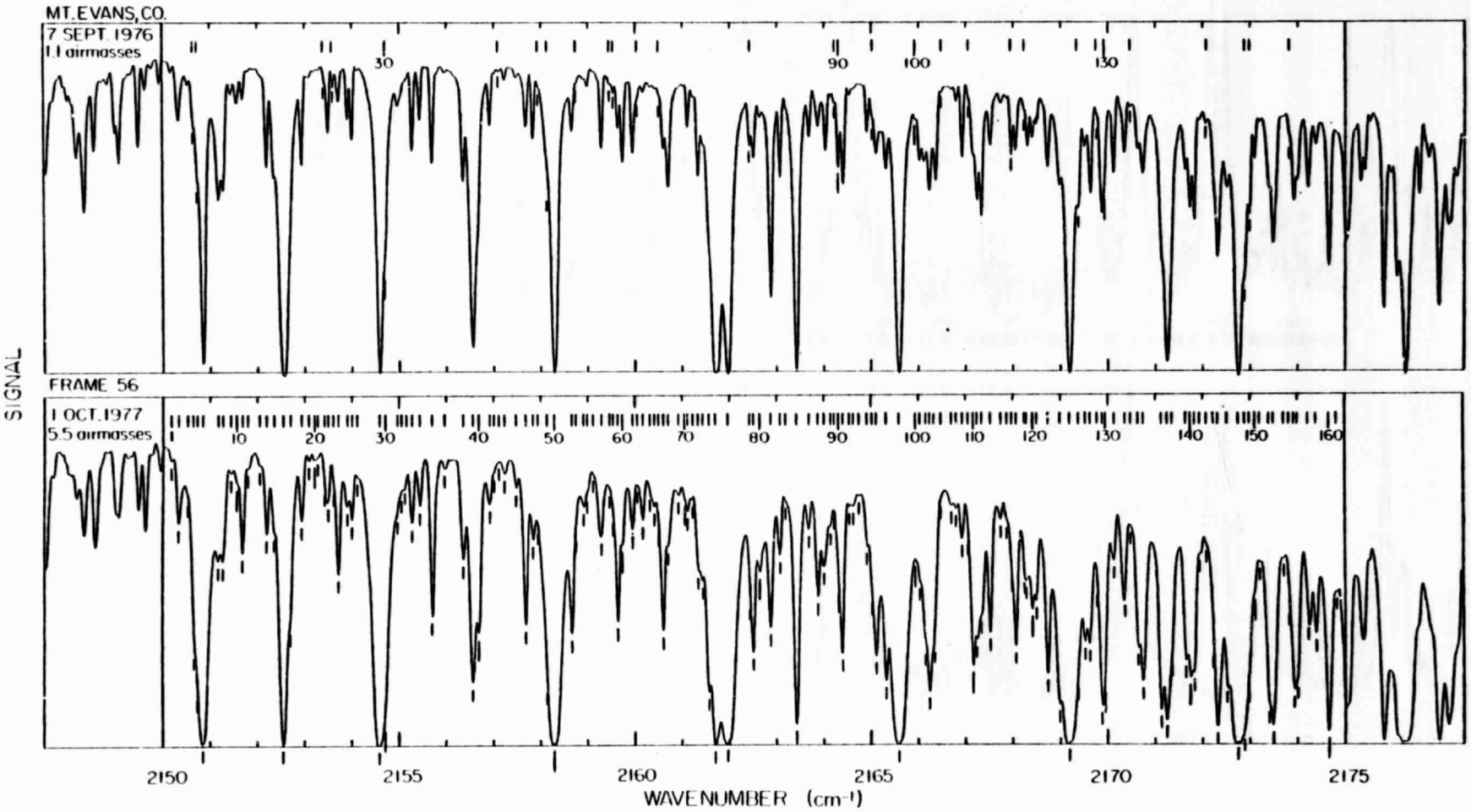

MT. EVANS, CO.
7 SEPT. 1976
1.1 airmasses
70
80
FRAME 51
1 OCT. 1977
5.5 airmasses
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
SIGNAL
2025
2030
2035
2040
2045
2050
WAVENUMBER (cm⁻¹)


MT. EVANS, CO.
7 SEPT. 1976
1.1 airmasses
10
20
40
50
80
150
FRAME 52
1 OCT. 1977
5.5 airmasses
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
SIGNAL
2050
2055
2060
2065
2070
2075
WAVENUMBER (cm⁻¹)


MT. EVANS, CO.
7 SEPT. 1976
1.1 airmasses
10
20
130
FRAME 53
1 OCT. 1977
5.5 airmasses
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
SIGNAL
2075
2080
2085
2090
2095
2100
WAVENUMBER (cm⁻¹)


MT. EVANS, CO.
7 SEPT. 1976
1.1 airmasses
30
150
FRAME 54
1 OCT. 1977
5.5 airmasses
10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190
SIGNAL
2100
2105
2110
2115
2120
2125
WAVENUMBER (cm⁻¹)


MT. EVANS, CO.
7 SEPT. 1976
1.1 airmasses
40
70
160
FRAME 55
1 OCT. 1977
5.5 airmasses
10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170
SIGNAL
2125
2130
2135
2140
2145
2150
WAVENUMBER (cm-1)


MT. EVANS, CO.
7 SEPT. 1976
1.1 airmasses
30
90
100
130
FRAME 56
1 OCT. 1977
5.5 airmasses
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
SIGNAL
2150
2155
2160
2165
2170
2175
WAVENUMBER (cm⁻¹)

APPENDIX B

TABLES OF LINE POSITIONS AND IDENTIFICATIONS

FRAME 1 (775-800 cm^{-1})

Seq. No.	ν(observed) (cm^{-1})	Identification
1	775.568	H_2O, CO_2
2	775 825	CO_2
3	776.077	?
4	776.367	H_2O?
5	776.487	CO_2
6	776.581	CO_2
7	776.985	H_2O, CO_2
8	777.357	CO_2
9	777.739	?
10	777.856	O_3?
11	778.045	CO_2
12	778.236	CO_2
13	778.376	CO_2, H_2O
14	778.583	CO_2
15	778.819	CO_2?
16	778.941	CO_2
17	779.310	H_2O
18	779.586	CO_2
19	779.683	CO_2
20	779.816	CO_2?
21	780.080	CO_2
22	780.228	CO_2
23	780.379	CO_2?
24	780.508	CO_2
25	780.790	O_3
26	780.976	CO_2
27	781.165	O_3, CO_2
28	781.284	CO_2
29	781.448	H_2O*
30	781.559	CO_2?
31	781.600	CO_2
32	781.696	?
33	781.903	O_3
34	782.076	CO_2
35	782.247	CO_2
36	782.446	CO_2
37	782.662	O_3
38	782.780	CO_2
39	782.971	H_2O
40	783.110	CO_2, H_2O
41	783.424	CO_2
42	783.640	CO_2
43	783.782	?
44	783.917	H_2O
45	784.476	H_2O
46	784.911	O_3
47	785.195	CO_2
48	785.378	H_2O
49	785.561	?
50	785.641	O_3+?
51	785.788	CO_2
52	785.911	CO_2
53	786.042	CO_2 +?
54	786.394	O_3
55	786.487	CO_2
56	786.767	CO_2
57	787.140	O_3
58	787.291	CO_2
59	787.354	CO_2
60	787.464	O_3

FRAME 1 (775-800 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
61	787.572	?
62	787.705	H_2O*?, CO_2
63	787.857	O_3
64	788.142	CO_2
65	788.245	O_3
66	788.329	CO_2
67	788.588	?
68	788.774	CO_2
69	788.888	?
70	788.998	O_3
71	789.113	CO_2, O_3
72	789.317	O_3
73	789.430	CO_2
74	789.628	CO_2
75	789.756	O_3
76	789.901	CO_2, O_3
77	790.041	O_3+?
78	790.267	CO_2
79	790.514	O_3
80	790.699	CO_2, O_3
81	790.846	CO_2
82	791.026	CO_2
83	791.284	O_3
84	791.548	CO_2
85	791.978	CO_2
86	792.053	CO_2, H_2O
87	792.160	CO_2
88	792.262	CO_2
89	792.384	CO_2
90	792.512	CO_2
91	792.646	CO_2
92	792.785	CO_2
93	792.945	CO_2
94	793.103	CO_2
95	793.275	CO_2
96	793.479	CO_2, H_2O
97	793.925	H_2O, CO_2
98	794.223	H_2O
99	794.513	?
100	794.587	CO_2
101	794.773	CO_2 +?
102	794.968	O_3
103	795.128	CO_2
104	795.357	CO_2, O_3
105	795.909	H_2O
106	796.409	?
107	796.710	H_2O
108	796.906	CO_2
109	797.057	?
110	797.553	H_2O
111	797.852	O_3
112	798.005	CO_2
113	798.567	H_2O, CO_2
114	798.760	H_2O
115	799.074	H_2O
116	799.401	?
117	799.580	CO_2

FRAME 2 (800-825 cm^{-1})

Seq. No.	ν(observed) (cm^{-1})	Identification
1	800.039	CO_2
2	800.204	O_3
3	800.441	CO_2
4	800.629	O_3
5	800.785	?
6	800.973	CO_2, O_3
7	801.381	O_3
8	801.589	CO_2
9	801.862	CO_2, H_2O
10	802.091	O_3
11	802.345	?
12	802.526	CO_2, H_2O
13	803.003	H_2O
14	803.143	CO_2
15	803.543	H_2O
16	804.020	CO_2
17	804.263	?
18	804.706	CO_2
19	805.009	O_3
20	805.120	H_2O?
21	805.262	SiI?
22	805.552	CO_2
23	805.710	?
24	805.828	O_3+?
25	805.997	H_2O
26	806.263	CO_2
27	806.594	O_3
28	806.696	H_2O*
29	807.035	?
30	807.119	CO_2
31	807.377	O_3?
32	807.821	CO_2
33	808.050	H_2O
34	808.286	H_2O
35	808.918	O_3?
36	809.379	CO_2
37	809.677	?
38	809.788	?
39	809.974	?
40	810.282	NaI?
41	810.458	?
42	810.556	?
43	810.719	CO_2
44	810.935	CO_2
45	811.216	?
46	811.427	?
47	811.971	?
48	812.170	CO_2
49	812.491	CO_2
50	812.713	CO_2
51	812.868	?
52	813.000	?
53	813.267	?
54	813.479	?
55	813.851	H_2O
56	814.042	CO_2
57	814.514	H_2O
58	814.935	?
59	815.228	CO_2
60	815.336	?

Most of the unidentified lines on this page have been tentatively identified as being O_3 lines.

FRAME 2 (800-825 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
61	815.602	CO_2
62	815.954	solar
63	816.100	?
64	816.461	H_2O
65	816.683	CO_2 +?
66	816.874	?
67	817.161	CO_2
68	817.638	?
69	817.725	?
70	817.881	?
71	818.396	?
72	818.717	CO_2
73	819.143	MgI? +?
74	819.315	?
75	819.728	CO_2
76	819.904	?
77	820.037	?
78	820.277	CO_2
79	820.651	?
80	820.752	NaI? +?
81	820.873	?
82	820.967	?
83	821.270	CO_2
84	821.410	?
85	821.839	CO_2
86	822.138	?
87	822.311	?
88	822.526	?
89	822.671	H_2O
90	822.833	CO_2 +?
91	823.398	CO_2
92	823.599	CO_2
93	823.765	?
94	824.057	?
95	824.225	?
96	824.329	CO_2 +?
97	824.455	?
98	824.976	CO_2

Most of the unidentified lines on this page have been tentatively identified as being O_3 lines.

FRAME 3 (825-850 cm^{-1})

Seq. No.	ν(observed) (cm^{-1})	Identification
1	825.171	H_2O
2	825.586	?
3	825.804	NO_2?
4	826.003	CO_2 +?
5	826.158	?
6	826.367	?
7	826.523	CO_2
8	826.745	?
9	827.115	H_2O
10	827.707	H_2O
11	828.091	CO_2
12	828.225	CO_2
13	828.608	CO_2
14	828.806	CO_2
15	828.938	CO_2
16	829.055	CO_2
17	829.164	CO_2
18	829.308	CO_2
19	829.470	CO_2
20	829.665	CO_2, H_2O
21	829.873	CO_2
22	830.055	CO_2 +?
23	830.190	CO_2 +?
24	830.300	?
25	830.478	?
26	830.637	CO_2
27	830.729	H_2O
28	831.232	CO_2
29	831.545	?
30	832.010	?
31	832.148	CO_2
32	832.250	?
33	832.637	?
34	832.785	CO_2
35	832.986	CO_2
36	833.529	?
37	833.741	CO_2
38	834.377	CO_2
39	834.579	CO_2
40	834.845	?
41	835.282	CO_2
42	835.548	H_2O
43	835.957	CO_2
44	836.188	CO_2
45	836.520	CO_2 +?
46	836.862	CO_2
47	837.224	CO_2 +?
48	837.532	CO_2
49	837.665	?
50	837.761	CO_2
51	838.058	H_2O
52	838.260	?
53	838.401	CO_2
54	838.475	?
55	838.611	?
56	839.194	?
57	839.411	CO_2
58	839.660	H_2O
59	839.875	H_2O
60	840.002	H_2O

835-855 cm^{-1} region is superimposed on a broad $CFCl_3$ band.

FRAME 3 (825-850 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
61	840.336	H_2O
62	840.687	CO_2 +?
63	841.003	CO_2
64	841.094	H_2O*
65	841.385	?
66	841.566	CO_2
67	841.912	H_2O
68	842.181	?
69	842.265	CO_2
70	842.605	CO_2
71	843.095	CO_2
72	843.643	NO_2?
73	844.121	?
74	844.243	CO_2
75	844.675	CO_2
76	844.822	?
77	845.736	H_2O*
78	845.845	CO_2
79	846.192	CO_2
80	846.294	H_2O
81	846.640	H_2O, CO_2
82	846.709	?
83	846.851	solar?
84	847.121	?
85	847.285	solar
86	847.491	CO_2
87	847.623	?
88	847.771	CO_2
89	848.021	?
90	848.476	?
91	848.798	?
92	848.904	?
93	849.084	?
94	849.190	CO_2
95	849.595	H_2O

835-855 cm^{-1} region is superimposed on a broad $CFCl_3$ band.

FRAME 4 (850-875 cm^{-1})

Seq. No.	ν(observed) (cm^{-1})	Identification
1	850.171	?
2	850.350	?
3	850.634	?
4	850.805	CO_2
5	851.020	H_2O
6	851.266	HNO_3 +?
7	851.367	CO_2, HNO_3, NH_3
8	851.492	H_2O
9	851.646	HNO_3
10	852.444	H_2O
11	852.766	H_2O
12	852.922	H_2O
13	853.393	H_2O
14	853.783	HNO_3
15	853.853	NH_3
16	853.996	CO_2
17	854.117	CO_2
18	854.596	H_2O
19	855.277	HNO_3
20	855.532	CO_2
21	855.735	CO_2, HNO_3
22	856.085	CO_2, HNO_3
23	856.238	HNO_3
24	856.558	HNO_3
25	856.696	HNO_3
26	857.010	HNO_3, CO_2
27	857.130	HNO_3
28	857.214	HNO_3?
29	857.336	HNO_3
30	857.492	HNO_3, CO_2
31	857.591	HNO_3, CO_2
32	857.688	HNO_3
33	857.942	HNO_3
34	858.145	HNO_3
35	858.278	HNO_3
36	858.550	H_2O
37	858.888	HNO_3
38	858.991	HNO_3
39	859.074	HNO_3, CO_2
40	859.190	HNO_3, CO_2
41	859.450	HNO_3
42	859.670	H_2O
43	859.911	HNO_3
44	860.025	HNO_3
45	860.325	HNO_3
46	860.470	HNO_3
47	860.568	HNO_3?
48	860.794	HNO_3, CO_2
49	860.971	HNO_3
50	861.085	HNO_3, H_2O
51	861.298	HNO_3
52	861.388	HNO_3
53	861.725	HNO_3
54	861.825	HNO_3
55	862.038	solar, HNO_3
56	862.196	HNO_3
57	862.320	HNO_3, CO_2
58	862.501	H_2O, solar
59	862.659	HNO_3
60	862.762	HNO_3

835-855 cm^{-1} region is superimposed on a broad $CFCl_3$ band.

FRAME 4 (850-875 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
61	862.891	HNO_3
62	863.116	HNO_3
63	863.209	HNO_3
64	863.348	HNO_3
65	863.448	HNO_3
66	863.579	HNO_3, CO_2
67	863.686	HNO_3, CO_2
68	864.042	HNO_3, CO_2
69	864.129	HNO_3, CO_2
70	864.307	HNO_3, CO_2
71	864.495	HNO_3, CO_2
72	864.599	HNO_3, CO_2
73	864.957	H_2O, HNO_3
74	865.449	H_2O
75	865.687	H_2O, HNO_3
76	865.839	HNO_3
77	866.054	HNO_3
78	866.317	HNO_3
79	866.467	HNO_3
80	866.584	HNO_3, solar
81	866.764	HNO_3, H_2O
82	866.957	HNO_3, solar
83	867.045	HNO_3
84	867.215	HNO_3
85	867.371	HNO_3
86	867.664	HNO_3
87	867.835	HNO_3
88	867.977	HNO_3, NH_3
89	868.111	HNO_3
90	868.247	HNO_3
91	868.364	HNO_3
92	868.552	HNO_3
93	868.730	HNO_3
94	868.897	HNO_3
95	869.001	HNO_3
96	869.105	HNO_3
97	869.237	HNO_3
98	869.339	?
99	869.448	HNO_3
100	869.667	HNO_3
101	869.886	HNO_3
102	870.190	HNO_3
103	870.328	HNO_3
104	870.510	HNO_3
105	870.581	HNO_3
106	870.773	HNO_3
107	871.265	H_2O, HNO_3
108	871.638	HNO_3
109	872.077	HNO_3
110	872.269	HNO_3
111	872.410	HNO_3
112	872.515	HNO_3
113	872.686	HNO_3
114	872.950	HNO_3
115	873.103	CO_2?
116	873.264	HNO_3
117	873.382	HNO_3
118	873.479	HNO_3
119	873.705	HNO_3
120	873.813	HNO_3

FRAME 4 (850-875 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
121	873.949	HNO_3
122	874.042	HNO_3, CO_2
123	874.248	HNO_3
124	874.458	HNO_3, CO_2
125	874.671	HNO_3
126	874.765	HNO_3
127	874.969	HNO_3

FRAME 5 (875-900 cm^{-1})

Seq. No.	ν(observed) (cm^{-1})	Identification
1	875.094	HNO_3
2	875.282	HNO_3
3	875.428	HNO_3
4	875.525	HNO_3, CO_2
5	875.621	HNO_3
6	875.765	HNO_3
7	875.960	H_2O, HNO_3
8	876.209	HNO_3
9	876.371	HNO_3
10	876.476	HNO_3, CO_2
11	876.710	HNO_3
12	876.867	HNO_3
13	876.994	HNO_3
14	877.193	HNO_3
15	877.345	HNO_3
16	877.430	HNO_3
17	877.519	HNO_3
18	877.651	HNO_3
19	877.832	HNO_3
20	877.939	HNO_3
21	878.081	HNO_3
22	878.282	HNO_3
23	878.547	H_2O
24	878.781	HNO_3
25	878.941	HNO_3
26	879.032	HNO_3
27	879.228	HNO_3
28	879.359	HNO_3
29	879.488	HNO_3
30	879.709	HNO_3
31	879.868	HNO_3
32	880.069	?
33	880.180	HNO_3
34	880.364	HNO_3, CO_2
35	880.509	HNO_3
36	880.651	HNO_3
37	880.797	HNO_3
38	881.094	H_2O
39	881.400	HNO_3
40	881.592	HNO_3
41	881.795	HNO_3
42	882.057	HNO_3
43	882.217	HNO_3
44	882.417	HNO_3
45	882.523	HNO_3
46	882.624	HNO_3
47	882.791	HNO_3
48	882.880	CaI?
49	883.095	H_2O
50	883.449	HNO_3
51	883.860	H_2O
52	884.235	HNO_3, CO_2
53	884.369	HNO_3
54	884.485	HNO_3
55	884.646	HNO_3, H_2O
56	884.835	HNO_3
57	885.046	HNO_3
58	885.166	HNO_3, H_2O
59	885.297	HNO_3
60	885.440	HNO_3

FRAME 5 (875-900 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
61	885.633	H_2O?
62	885.753	HNO_3
63	885.846	HNO_3
64	886.096	CO_2, HNO_3
65	886.235	HNO_3
66	886.417	HNO_3, CO_2
67	886.649	HNO_3
68	887.230	H_2O
69	887.551	HNO_3
70	887.818	HNO_3
71	888.017	HNO_3
72	888.207	HNO_3
73	888.638	H_2O
74	888.974	HNO_3
75	889.367	HNO_3
76	889.780	HNO_3, CO_2
77	890.092	H_2O
78	890.229	HNO_3
79	890.526	HNO_3
80	890.678	HNO_3
81	890.903	HNO_3
82	891.002	HNO_3?
83	891.123	HNO_3
84	891.299	H_2O, HNO_3
85	891.533	CO_2, HNO_3
86	891.653	HNO_3
87	891.874	NH_3
88	892.029	HNO_3
89	892.170	HNO_3
90	892.423	HNO_3
91	892.519	HNO_3
92	892.810	HNO_3
93	892.991	HNO_3, CO_2
94	893.161	HNO_3
95	893.285	HNO_3
96	893.387	CO_2, HNO_3
97	893.545	HNO_3
98	893.680	HNO_3
99	893.791	HNO_3
100	893.909	HNO_3
101	894.106	HNO_3
102	894.288	HNO_3
103	894.423	HNO_3
104	894.526	CO_2
105	894.628	HNO_3
106	894.719	HNO_3
107	895.034	HNO_3, CO_2
108	895.138	CO_2, HNO_3
109	895.399	HNO_3
110	895.619	HNO_3
111	895.748	HNO_3
112	895.934	H_2O, HNO_3
113	896.179	HNO_3
114	896.354	HNO_3
115	896.507	H_2O, CO_2, HNO_3
116	896.812	HNO_3
117	896.918	CO_2, HNO_3
118	897.016	CO_2, HNO_3
119	897.206	HNO_3
120	897.340	HNO_3

FRAME 5 (875-900 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
121	897.701	H_2O
122	898.041	HNO_3
123	898.135	H_2O
124	898.264	HNO_3?
125	898.423	CO_2
126	898.655	CO_2, HNO_3
127	898.808	HNO_3
128	898.987	CO_2, HNO_3
129	899.077	HNO_3
130	899.163	HNO_3
131	899.376	HNO_3
132	899.538	HNO_3
133	899.722	HNO_3
134	899.831	HNO_3
135	899.941	HNO_3

FRAME 6 (900-925 cm^{-1})

Seq. No.	ν(observed) (cm^{-1})	Identification
1	900.108	HNO_3
2	900.356	CO_2, HNO_3
3	900.519	HNO_3
4	900.763	HNO_3
5	900.943	CO_2 +?
6	901.152	HNO_3
7	901.272	HNO_3
8	901.552	HNO_3
9	901.715	HNO_3
10	901.945	HNO_3
11	902.083	CO_2
12	902.222	CO_2, HNO_3
13	902.350	HNO_3
14	902.634	H_2O
15	902.732	HNO_3
16	902.872	CO_2
17	902.975	?
18	903.124	HNO_3
19	903.320	HNO_3
20	903.515	HNO_3
21	903.783	CO_2
22	903.903	HNO_3
23	904.102	CO_2 +?
24	904.288	HNO_3
25	904.488	?
26	904.680	HNO_3
27	904.789	CO_2
28	905.056	HNO_3
29	905.162	HNO_3, solar?
30	905.434	H_2O, CO_2, HNO_3
31	905.814	HNO_3
32	905.949	CO_2
33	906.241	H_2O
34	906.335	H_2O
35	906.565	HNO_3
36	906.646	CO_2
37	906.763	H_2O
38	906.943	HNO_3
39	907.051	CO_2
40	907.331	HNO_3
41	907.441	HNO_3
42	907.705	HNO_3
43	907.784	CO_2, H_2O
44	908.034	HNO_3, H_2O
45	908.134	HNO_3, NH_3
46	908.465	CO_2, HNO_3
47	908.970	H_2O
48	909.550	CO_2, HNO_3
49	909.898	HNO_3
50	910.108	H_2O*
51	910.277	H_2O, CO_2
52	910.433	HNO_3
53	910.630	HNO_3
54	910.721	H_2O
55	910.833	HNO_3
56	910.985	HNO_3
57	911.221	HNO_3
58	911.364	CO_2, HNO_3
59	911.530	H_2O*?
60	911.727	HNO_3

FRAME 6 (900-925 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
61	911.956	HNO_3
62	912.121	CO_2, HNO_3
63	912.230	CO_2, H_2O
64	912.427	HNO_3
65	912.670	HNO_3
66	912.815	HNO_3
67	912.921	HNO_3, CO_2
68	913.136	CO_2, HNO_3
69	913.317	HNO_3
70	913.510	HNO_3
71	913.981	H_2O
72	914.230	HNO_3, CO_2
73	914.428	CO_2
74	914.620	HNO_3
75	914.837	CO_2
76	914.983	HNO_3
77	915.185	?
78	915.303	HNO_3
79	915.472	HNO_3?
80	915.639	CO_2
81	915.869	HNO_3
82	915.990	HNO_3
83	916.090	HNO_3, H_2O
84	916.225	HNO_3
85	916.354	HNO_3
86	916.584	CO_2
87	916.858	HNO_3, H_2O
88	917.026	?
89	917.258	CO_2
90	917.352	CO_2
91	917.817	HNO_3, CF_2Cl_2
92	918.293	CO_2
93	918.477	H_2O
94	918.725	CO_2
95	919.050	CO_2
96	919.234	HNO_3
97	919.359	CF_2Cl_2
98	919.564	HNO_3
99	919.744	CF_2Cl_2, N_2O
100	919.854	CF_2Cl_2 +?
101	919.955	CO_2
102	920.230	CO_2, HNO_3
103	920.377	HNO_3, CF_2Cl_2
104	920.502	HNO_3
105	920.610	N_2O
106	920.724	CO_2, CF_2Cl_2
107	920.835	CO_2
108	921.085	CF_2Cl_2
109	921.416	H_2O*
110	921.703	CF_2Cl_2, CO_2
111	922.151	H_2O
112	922.629	CF_2Cl_2, HNO_3
113	922.923	CO_2, CF_2Cl_2
114	923.116	CF_2Cl_2, CO_2
115	923.543	HNO_3 +?
116	923.692	NaI?
117	923.929	solar?
118	924.023	CO_2
119	924.204	N_2O, CF_2Cl_2
120	924.545	CO_2

FRAME 6 (900-925 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
121	924.671	CF_2Cl_2?
122	924.998	H_2O, CO_2

FRAME 7A (925-950 cm^{-1})

Seq. No.	ν(observed) (cm^{-1})	Identification
1	925.480	H_2O
2	925.940	CO_2
3	926.146	CF_2Cl_2
4	926.292	CF_2Cl_2
5	926.464	CF_2Cl_2
6	926.622	CF_2Cl_2
7	926.751	CF_2Cl_2
8	927.016	CO_2
9	927.314	CO_2, NH_3
10	927.537	?
11	928.682	H_2O, CO_2
12	929.015	CO_2, H_2O
13	929.318	CF_2Cl_2
14	929.479	CO_2, CF_2Cl_2
15	930.019	CO_2
16	930.224	CO_2
17	930.774	H_2O, CF_2Cl_2
18	931.008	CO_2
19	931.322	CO_2, NH_3
20	931.752	CO_2, H_2O, NH_3
21	932.296	H_2O
22	932.468	CO_2
23	932.626	CO_2
24	932.968	CO_2
25	933.193	CO_2
26	933.902	CO_2
27	934.660	CO_2
28	934.900	CO_2
29	935.135	CO_2
30	935.368	CO_2
31	936.077	CO_2
32	936.802	CO_2
33	937.317	H_2O*
34	938.692	CO_2
35	940.552	CO_2
36	942.385	CO_2

FRAME 7B (925-950 cm^{-1})

Seq. No.	ν(observed) (cm^{-1})	Identification
1	927.016	CO_2
2	929.015	CO_2, H_2O
3	931.008	CO_2
4	932.968	CO_2
5	934.900	CO_2
6	936.077	CO_2
7	936.802	CO_2
8	937.317	H_2O*
9	937.483	CO_2
10	938.142	CO_2
11	938.692	CO_2
12	938.876	CO_2
13	939.492	CO_2
14	940.241	CO_2
15	940.552	CO_2
16	940.829	CO_2
17	941.034	H_2O*
18	941.586	CO_2
19	942.385	CO_2
20	942.558	?
21	942.794	?
22	942.901	CO_2
23	943.415	CO_2
24	943.540	?
25	943.866	H_2O
26	944.195	CO_2
27	944.416	H_2O
28	944.632	CO_2
29	944.853	H_2O
30	944.941	H_2O
31	945.460	CO_2
32	945.981	CO_2
33	946.680	H_2O, CO_2
34	947.096	CO_2
35	947.743	CO_2
36	947.927	CO_2
37	948.270	H_2O
38	948.581	?
39	949.480	CO_2

FRAME 8 (950-975 cm^{-1})

Seq. No.	ν(observed) (cm^{-1})	Identification
1	951.192	CO_2
2	952.882	CO_2
3	953.366	H_2O
4	954.113	H_2O
5	954.546	CO_2
6	955.256	H_2O
7	955.687	H_2O
8	956.186	CO_2
9	957.800	CO_2
10	958.836	H_2O
11	959.223	H_2O
12	959.392	CO_2
13	959.644	H_2O
14	959.850	H_2O
15	960.432	?
16	960.487	H_2O
17	960.631	?
18	960.766	H_2O
19	961.105	H_2O
20	961.370	?
21	961.643	O_3?
22	961.734	CO_2
23	961.903	H_2O
24	963.265	CO_2
25	964.771	CO_2
26	965.535	O_3?
27	965.885	H_2O
28	965.960	H_2O
29	966.251	CO_2
30	966.625	O_3
31	966.720	O_3
32	966.882	H_2O
33	967.066	O_3
34	967.709	CO_2
35	968.575	?
36	968.920	?
37	969.141	CO_2
38	970.100	CO_2, O_3
39	970.30	O_3, H_2O
40	970.5	CO_2, H_2O*
41	970.7	O_3
42	971.033	O_3
43	971.362	H_2O
44	971.592	O_3
45	971.662	H_2O
46	971.932	CO_2
47	972.160	O_3
48	972.245	O_3
49	972.383	H_2O, O_3
50	972.541	O_3
51	972.638	O_3
52	972.755	O_3
53	972.956	O_3
54	973.090	O_3
55	973.290	CO_2
56	973.490	H_2O
57	973.728	O_3
58	973.855	O_3
59	973.985	H_2O
60	974.474	O_3

FRAME 8 (950-975 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
61	974.621	CO_2
62	974.832	O_3
63	974.952	O_3

FRAME 9 (975-1000 cm^{-1})

Seq. No.	ν(observed) (cm^{-1})	Identification
1	975.107	O_3
2	975.180	O_3
3	975.280	O_3
4	975.363	O_3
5	975.471	O_3
6	975.623	O_3
7	975.935	CO_2, H_2O
8	976.045	O_3
9	976.147	O_3
10	976.258	O_3
11	976.465	H_2O
12	976.521	O_3
13	976.666	O_3
14	976.810	O_3+?
15	976.975	O_3
16	977.216	CO_2
17	977.427	H_2O
18	977.512	O_3
19	977.626	O_3?
20	977.708	O_3
21	977.845	O_3+?
22	977.925	O_3
23	978.132	O_3
24	978.228	O_3
25	978.344	O_3
26	978.473	CO_2
27	978.559	O_3
28	978.637	O_3
29	978.694	O_3
30	978.793	O_3
31	978.869	O_3, H_2O
32	978.961	O_3
33	979.056	O_3
34	979.162	O_3
35	979.235	O_3
36	979.342	O_3+?
37	979.478	O_3
38	979.705	CO_2
39	979.805	O_3
40	979.920	O_3
41	980.043	O_3
42	980.116	O_3
43	980.201	O_3
44	980.316	O_3
45	980.409	O_3, H_2O
46	980.569	O_3
47	980.653	O_3
48	980.767	O_3
49	980.914	CO_2
50	981.046	O_3
51	981.183	O_3
52	981.277	O_3
53	981.397	H_2O, O_3
54	981.491	O_3
55	981.571	?
56	981.685	O_3
57	981.742	O_3
58	981.839	O_3
59	981.928	O_3
60	982.003	O_3

FRAME 9 (975-1000 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
61	982.095	CO_2, H_2O
62	982.271	O_3
63	982.394	O_3
64	982.468	O_3
65	982.571	O_3
66	982.623	O_3
67	982.749	O_3
68	982.808	O_3
69	982.911	O_3+?
70	983.028	O_3
71	983.087	O_3
72	983.262	CO_2, O_3
73	983.357	O_3
74	983.422	O_3
75	983.490	O_3
76	983.561	?
77	983.686	O_3
78	983.763	O_3
79	983.889	O_3
80	983.973	O_3
81	984.106	H_2O, O_3
82	984.207	O_3
83	984.386	CO_2, O_3
84	984.536	O_3
85	984.607	O_3
86	984.693	O_3
87	984.754	O_3
88	984.845	O_3
89	984.912	O_3
90	984.978	O_3?
91	985.061	O_3
92	985.146	O_3
93	985.192	?
94	985.399	O_3
95	985.498	CO_2
96	985.619	O_3?
97	985.707	O_3
98	985.786	O_3
99	985.916	O_3
100	986.013	O_3
101	986.101	O_3
102	986.174	O_3
103	986.254	O_3
104	986.372	O_3
105	986.460	O_3
106	986.593	CO_2, O_3
107	986.694	O_3
108	986.789	O_3
109	986.864	O_3
110	987.033	?
111	987.118	O_3
112	987.232	O_3
113	987.335	O_3
114	987.392	O_3
115	987.500	O_3
116	987.608	CO_2
117	987.687	O_3
118	987.761	O_3
119	987.869	O_3
120	987.926	O_3

FRAME 9 (975-1000 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
121	988.009	O_3
122	988.133	O_3
123	988.219	O_3
124	988.305	O_3+?
125	988.403	O_3
126	988.549	O_3
127	988.641	CO_2, O_3
128	988.738	O_3
129	988.808	O_3
130	988.886	O_3, H_2O
131	989.014	O_3
132	989.113	O_3
133	989.212	O_3
134	989.327	O_3
135	989.440	O_3
136	989.623	CO_2, O_3
137	989.717	O_3
138	989.775	O_3
139	989.857	O_3
140	989.946	O_3
141	990.064	O_3+?
142	990.166	O_3, H_2O
143	990.260	O_3
144	990.419	O_3
145	990.515	O_3
146	990.604	O_3, CO_2
147	990.711	O_3
148	990.780	O_3?
149	990.860	O_3
150	990.982	O_3
151	991.147	O_3
152	991.232	O_3
153	991.356	O_3
154	991.468	O_3, H_2O
155	991.628	O_3, CO_2
156	991.771	O_3
157	991.884	O_3
158	991.947	O_3
159	992.032	O_3
160	992.123	O_3
161	992.220	CO_2
162	992.322	O_3
163	992.451	O_3
164	992.593	O_3
165	992.665	O_3?
166	992.742	O_3
167	992.833	O_3
168	992.946	O_3
169	993.013	O_3
170	993.166	O_3
171	993.257	O_3
172	993.326	O_3
173	993.426	O_3
174	993.514	O_3
175	993.622	O_3+?
176	993.721	O_3
177	993.796	O_3
178	993.886	O_3
179	993.976	O_3
180	994.042	O_3

FRAME 9 (975-1000 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
181	994.141	O_3
182	994.332	O_3
183	994.451	O_3, H_2O
184	994.540	O_3
185	994.647	O_3
186	994.736	O_3, H_2O
187	994.826	O_3, H_2O
188	994.907	O_3
189	995.012	O_3
190	995.145	O_3
191	995.248	O_3+?
192	995.320	H_2O, O_3
193	995.419	O_3
194	995.515	O_3
195	995.604	O_3
196	995.702	O_3
197	995.769	O_3
198	995.849	O_3
199	995.894	O_3
200	996.022	O_3
201	996.165	O_3
202	996.249	O_3
203	996.387	O_3
204	996.466	O_3
205	996.557	O_3
206	996.667	O_3
207	996.748	O_3
208	996.845	O_3
209	996.971	O_3
210	997.017	O_3
211	997.104	O_3
212	997.192	O_3
213	997.303	O_3
214	997.402	O_3, H_2O
215	997.511	O_3
216	997.546	O_3
217	997.679	H_2O, O_3
218	997.766	O_3
219	997.905	O_3
220	997.980	O_3
221	998.077	O_3
222	998.194	O_3
223	998.238	O_3
224	998.340	O_3
225	998.435	O_3
226	998.524	O_3, H_2O
227	998.667	O_3
228	998.753	O_3
229	998.852	O_3, H_2O
230	998.992	O_3
231	999.177	O_3
232	999.392	O_3
233	999.463	O_3
234	999.580	O_3
235	999.673	O_3
236	999.711	O_3
237	999.806	O_3
238	999.908	O_3
239	999.995	O_3

FRAME 10 (1000-1025 cm^{-1})

Seq. No.	ν(observed) (cm^{-1})	Identification
1	1000.036	O_3
2	1000.136	O_3
3	1000.222	O_3
4	1000.302	H_2O, O_3
5	1000.405	O_3
6	1000.488	O_3
7	1000.557	O_3
8	1000.639	O_3
9	1000.713	O_3
10	1000.834	O_3
11	1000.946	O_3
12	1001.082	O_3, H_2O
13	1001.222	O_3
14	1001.314	O_3
15	1001.397	O_3
16	1001.537	O_3
17	1001.623	O_3
18	1001.728	O_3
19	1001.902	O_3
20	1002.026	O_3
21	1002.148	O_3
22	1002.248	O_3
23	1002.331	O_3
24	1002.449	O_3
25	1002.500	O_3
26	1002.614	O_3, H_2O
27	1002.720	O_3
28	1002.838	O_3
29	1002.956	O_3
30	1003.085	O_3
31	1003.124	O_3
32	1003.228	O_3
33	1003.373	O_3
34	1003.511	O_3, H_2O
35	1003.585	O_3
36	1003.656	O_3, H_2O
37	1003.745	O_3
38	1003.814	O_3
39	1003.912	O_3
40	1004.031	O_2
41	1004.129	O_3
42	1004.196	O_3
43	1004.281	O_3
44	1004.345	O_3
45	1004.457	O_3, H_2O
46	1004.595	O_3
47	1004.685	O_3
48	1004.761	O_3
49	1004.873	O_3
50	1004.923	O_3
51	1005.035	O_3
52	1005.152	O_3
53	1005.227	O_3
54	1005.385	O_3
55	1005.482	O_3
56	1005.542	O_3
57	1005.682	O_3
58	1005.768	O_3
59	1005.860	O_3
60	1005.945	O_3

FRAME 10 (1000-1025 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
61	1006.037	O_3
62	1006.144	O_3
63	1006.257	O_3
64	1006.422	O_3
65	1006.520	O_3
66	1006.584	O_3
67	1006.692	O_3
68	1006.748	O_3
69	1006.852	O_3
70	1006.968	O_3
71	1007.040	O_3
72	1007.148	O_3
73	1007.262	O_3, H_2O
74	1007.301	O_3
75	1007.412	O_3
76	1007.499	O_3
77	1007.554	O_3
78	1007.618	O_3
79	1007.692	O_3
80	1007.778	O_3
81	1007.866	O_3
82	1007.922	O_3
83	1008.022	O_3
84	1008.093	O_3
85	1008.216	O_3
86	1008.309	O_3
87	1008.423	O_3
88	1008.501	O_3
89	1008.620	O_3
90	1008.729	O_3
91	1008.791	O_3
92	1008.892	O_3?
93	1009.002	O_3
94	1009.098	O_3
95	1009.202	O_3
96	1009.372	O_3
97	1009.456	O_3
98	1009.550	O_3
99	1009.694	O_3
100	1009.819	O_3
101	1009.883	O_3
102	1009.957	O_3
103	1010.031	H_2O
104	1010.117	O_3
105	1010.183	O_3
106	1010.267	O_3
107	1010.376	O_3
108	1010.464	O_3
109	1010.536	O_3
110	1010.717	O_3
111	1010.835	O_3, H_2O
112	1010.917	O_3
113	1011.085	O_3
114	1011.206	O_3?
115	1011.321	O_3
116	1011.416	O_3
117	1011.509	O_3
118	1011.667	O_3
119	1011.858	O_3
120	1011.941	O_3

FRAME 10 (1000-1025 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
121	1012.107	O_3
122	1012.182	O_3
123	1012.252	O_3
124	1012.353	O_3
125	1012.457	O_3
126	1012.567	O_3
127	1012.647	O_3
128	1012.781	O_3
129	1012.871	O_3
130	1012.942	O_3?
131	1013.037	O_3
132	1013.128	O_3
133	1013.300	O_3
134	1013.381	O_3
135	1013.490	O_3
136	1013.597	O_3
137	1013.702	O_3
138	1013.787	O_3
139	1013.863	O_3?
140	1013.934	O_3
141	1014.025	O_3
142	1014.142	O_3
143	1014.258	O_3
144	1014.475	O_3, H_2O
145	1014.588	O_3
146	1014.724	O_3
147	1014.834	O_3
148	1014.924	O_3
149	1015.064	O_3
150	1015.314	O_3
151	1015.362	O_3
152	1015.488	O_3
153	1015.607	O_3
154	1015.847	O_3
155	1015.947	O_3
156	1016.070	O_3
157	1016.166	O_3
158	1016.283	O_3
159	1016.378	O_3
160	1016.509	O_3
161	1016.757	O_3
162	1016.954	O_3
163	1017.056	O_3
164	1017.146	O_3
165	1017.224	O_3
166	1017.294	O_3
167	1017.501	O_3, H_2O
168	1017.600	O_3, H_2O
169	1017.717	O_3
170	1017.832	O_3
171	1017.883	O_3, H_2O
172	1018.054	O_3
173	1018.154	O_3
174	1018.369	O_3
175	1018.465	O_3
176	1018.569	O_3
177	1018.715	O_3
178	1018.820	O_3
179	1018.922	O_3
180	1019.014	O_3

FRAME 10 (1000-1025 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
181	1019.137	O_3
182	1019.241	O_3
183	1019.313	O_3
184	1019.494	O_3
185	1019.593	O_3, H_2O
186	1019.671	O_3
187	1019.787	O_3
188	1019.997	O_3
189	1020.114	O_3
190	1020.215	O_3
191	1020.314	O_3
192	1020.423	O_3
193	1020.537	O_3
194	1020.722	O_3
195	1020.876	O_3
196	1021.057	O_3
197	1021.130	O_3
198	1021.211	O_3
199	1021.296	O_3
200	1021.383	O_3
201	1021.466	O_3
202	1021.648	O_3
203	1021.805	O_3
204	1021.938	O_3, H_2O
205	1022.108	O_3
206	1022.214	O_3
207	1022.290	O_3
208	1022.359	O_3
209	1022.443	O_3
210	1022.676	O_3
211	1022.839	O_3
212	1022.920	O_3
213	1023.001	O_3
214	1023.150	O_3
215	1023.338	O_3
216	1023.415	O_3
217	1023.489	O_3
218	1023.600	O_3
219	1023.756	O_3
220	1023.890	O_3
221	1024.042	O_3
222	1024.178	O_3
223	1024.284	O_3
224	1024.397	O_3
225	1024.437	O_3
226	1024.519	O_3
227	1024.602	O_3
228	1024.696	O_3
229	1024.774	O_3
230	1024.921	O_3

FRAME 11 (1025-1050 cm^{-1})

Seq. No.	ν(observed) (cm^{-1})	Identification
1	1025.071	O_3
2	1025.198	O_3
3	1025.296	CO_2
4	1025.421	O_3
5	1025.461	O_3
6	1025.532	O_3
7	1025.726	O_3
8	1025.827	O_3
9	1025.931	O_3
10	1026.109	O_3
11	1026.212	O_3
12	1026.398	O_3
13	1026.486	O_3
14	1026.530	O_3
15	1026.831	O_3
16	1026.965	O_3
17	1027.101	O_3
18	1027.207	O_3
19	1027.304	O_3
20	1027.385	O_3, CO_2
21	1027.466	O_3
22	1027.541	O_3
23	1027.652	O_3
24	1027.741	O_3
25	1027.854	O_3
26	1027.925	O_3
27	1028.108	O_3
28	1028.164	O_3
29	1028.279	H_2O
30	1028.362	O_3
31	1028.523	O_3
32	1028.646	O_3, H_2O
33	1028.844	O_3
34	1028.910	O_3
35	1029.003	O_3
36	1029.090	O_3
37	1029.158	O_3
38	1029.259	O_3
39	1029.341	O_3
40	1029.443	O_3, CO_2
41	1029.522	O_3, H_2O
42	1029.691	H_2O, O_3
43	1029.855	O_3?
44	1029.978	O_3
45	1030.074	O_3
46	1030.114	O_3
47	1030.260	O_3
48	1030.346	O_3
49	1030.471	O_3, H_2O
50	1030.688	O_3
51	1030.817	O_3
52	1031.004	O_3
53	1031.049	O_3
54	1031.207	O_3
55	1031.281	O_3
56	1031.369	O_3
57	1031.455	O_3, CO_2
58	1031.520	O_3+?
59	1031.661	O_3
60	1031.783	O_3

FRAME 11 (1025-1050 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
61	1031.985	O_3
62	1032.048	O_3
63	1032.181	O_3, H_2O
64	1032.394	O_3
65	1032.530	O_3
66	1032.654	O_3
67	1032.736	O_3
68	1032.867	O_3
69	1032.945	O_3
70	1033.029	O_3, H_2O
71	1033.118	O_3
72	1033.230	O_3
73	1033.345	O_3
74	1033.499	O_3, CO_2
75	1033.678	O_3
76	1033.796	O_3
77	1033.863	O_3
78	1033.940	O_3
79	1034.064	O_3
80	1034.167	O_3
81	1034.263	O_3
82	1034.498	O_3
83	1034.601	O_3
84	1034.651	O_3
85	1034.786	O_3
86	1034.853	O_3
87	1035.087	O_3, H_2O
88	1035.200	O_3
89	1035.311	O_3
90	1035.367	O_3
91	1035.436	O_3, CO_2
92	1035.541	O_3
93	1035.696	O_3
94	1035.782	O_3
95	1035.921	O_3
96	1036.041	O_3
97	1036.106	O_3
98	1036.207	O_3
99	1036.316	O_3
100	1036.402	O_3
101	1036.439	O_3
102	1036.571	O_3
103	1036.694	O_3
104	1036.790	O_3
105	1036.893	O_3
106	1036.992	O_3
107	1037.084	O_3
108	1037.144	O_3
109	1037.246	O_3
110	1037.327	O_3
111	1037.457	O_3, CO_2
112	1037.599	O_3
113	1037.754	O_3
114	1037.825	O_3
115	1037.971	O_3
116	1038.061	O_3, H_2O
117	1038.152	O_3
118	1038.210	O_3
119	1038.279	O_3
120	1038.389	O_3

FRAME 11 (1025-1050 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
121	1038.460	O_3
122	1038.528	O_3
123	1038.648	O_3
124	1038.830	O_3
125	1038.991	O_3
126	1039.143	O_3
127	1039.237	O_3
128	1039.346	O_3, CO_2
129	1039.447	O_3, H_2O
130	1039.532	O_3, H_2O
131	1039.616	O_3
132	1039.727	O_3
133	1039.776	O_3
134	1039.864	O_3
135	1039.977	O_3
136	1040.050	O_3
137	1040.145	O_3
138	1040.284	O_3
139	1040.402	O_3
140	1040.490	O_3
141	1040.578	O_3
142	1040.683	O_3
143	1040.717	O_3
144	1040.814	O_3
145	1040.925	O_3
146	1041.010	O_3
147	1041.093	O_3
148	1041.168	O_3
149	1041.227	O_3, CO_2
150	1041.344	O_3
151	1041.415	O_3
152	1041.505	O_3
153	1041.587	O_3
154	1041.657	O_3
155	1041.763	O_3
156	1041.850	O_3
157	1042.017	O_3
158	1042.082	O_3
159	1042.176	O_3
160	1042.286	O_3
161	1042.439	O_3
162	1042.536	H_2O, O_3
163	1042.654	O_3
164	1042.799	O_3?
165	1042.910	O_3
166	1043.058	O_3
167	1043.168	CO_2, O_3
168	1043.309	O_3
169	1043.415	O_3
170	1043.479	O_3
171	1043.629	O_3
172	1043.728	O_3
173	1043.810	O_3
174	1043.863	O_3
175	1043.947	O_3
176	1044.082	O_3
177	1044.152	O_3
178	1044.266	O_3, H_2O
179	1044.354	O_3
180	1044.443	O_3

FRAME 11 (1025-1050 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
181	1044.554	O_3
182	1044.689	O_3
183	1044.818	O_3
184	1044.908	O_3
185	1045.017	CO_2
186	1045.153	O_3
187	1045.263	O_3
188	1045.359	O_3
189	1045.476	O_3
190	1045.582	O_3+?
191	1045.690	O_3
192	1045.803	O_3
193	1045.946	O_3
194	1045.999	O_3
195	1046.102	O_3
196	1046.211	O_3
197	1046.313	O_3
198	1046.466	O_3
199	1046.683	O_3
200	1046.815	O_3
201	1046.879	O_3, CO_2
202	1046.974	O_3
203	1047.150	O_3
204	1047.218	O_3
205	1047.414	O_3
206	1047.510	O_3
207	1047.620	O_3
208	1047.802	O_3
209	1047.968	O_3
210	1048.072	O_3
211	1048.169	O_3
212	1048.213	O_3
213	1048.386	O_3
214	1048.472	O_3
215	1048.704	O_3, CO_2
216	1048.880	O_3
217	1048.922	O_3
218	1049.028	O_3
219	1049.104	O_3
220	1049.373	O_3, H_2O
221	1049.443	O_3
222	1049.570	O_3
223	1049.644	O_3
224	1049.826	O_3
225	1049.909	O_3

FRAME 12 (1050-1075 cm^{-1})

Seq. No.	ν(observed) (cm^{-1})	Identification
1	1050.041	O_3
2	1050.094	O_3
3	1050.184	O_3, H_2O
4	1050.252	O_3
5	1050.393	O_3
6	1050.449	CO_2
7	1050.548	O_3
8	1050.656	O_3
9	1050.759	O_3
10	1050.868	O_3
11	1050.947	O_3
12	1051.048	O_3
13	1051.123	O_3
14	1051.244	O_3, H_2O
15	1051.492	O_3
16	1051.607	O_3
17	1051.642	O_3
18	1051.776	O_3
19	1051.904	O_3
20	1051.992	O_3
21	1052.038	O_3
22	1052.150	O_3
23	1052.294	O_3, CO_2
24	1052.395	O_3
25	1052.476	O_3
26	1052.587	O_3
27	1052.823	O_3
28	1052.896	O_3
29	1052.991	O_3
30	1053.070	O_3
31	1053.166	O_3
32	1053.259	O_3
33	1053.370	O_3
34	1053.466	O_3
35	1053.531	O_3
36	1053.657	O_3
37	1053.948	O_3, CO_2
38	1054.031	O_3
39	1054.125	O_3
40	1054.185	O_3
41	1054.289	O_3
42	1054.355	O_3
43	1054.460	O_3
44	1054.558	O_3
45	1054.757	O_3
46	1054.914	O_3
47	1055.007	O_3
48	1055.118	O_3
49	1055.217	O_3
50	1055.339	O_3
51	1055.398	O_3
52	1055.529	H_2O
53	1055.628	CO_2
54	1055.702	O_3
55	1055.831	O_3
56	1055.921	O_3
57	1055.992	O_3
58	1056.082	O_3
59	1056.166	O_3
60	1056.246	O_3

FRAME 12 (1050-1075 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
61	1056.364	O_3
62	1056.470	O_3
63	1056.575	O_3
64	1056.668	O_3, H_2O
65	1056.781	O_3
66	1056.942	O_3
67	1057.046	O_3
68	1057.179	O_3
69	1057.305	O_3, CO_2
70	1057.388	O_3
71	1057.590	O_3
72	1057.721	O_3
73	1057.827	O_3
74	1057.908	O_3
75	1058.032	O_3
76	1058.191	O_3
77	1058.249	O_3
78	1058.363	O_3
79	1058.466	O_3
80	1058.518	O_3
81	1058.662	O_3, H_2O
82	1058.870	O_3, CO_2
83	1059.026	O_3
84	1059.210	O_3
85	1059.383	O_3
86	1059.458	O_3
87	1059.534	O_3, H_2O
88	1059.628	O_3
89	1059.689	O_3
90	1059.796	O_3
91	1059.888	O_3
92	1059.987	O_3
93	1060.085	O_3, H_2O
94	1060.172	O_3
95	1060.298	O_3
96	1060.420	O_3
97	1060.517	O_3, CO_2
98	1060.679	O_3
99	1060.809	O_3
100	1060.894	O_3
101	1060.987	O_3
102	1061.049	O_3
103	1061.134	O_3
104	1061.218	O_3
105	1061.329	O_3
106	1061.426	O_3
107	1061.538	O_3
108	1061.641	O_3
109	1061.806	O_3
110	1061.841	O_3
111	1061.931	O_3
112	1062.021	O_3
113	1062.110	O_3, CO_2
114	1062.261	O_3
115	1062.404	O_3
116	1062.511	O_3
117	1062.603	O_3, H_2O
118	1062.664	O_3
119	1062.821	O_3
120	1062.913	O_3

FRAME 12 (1050-1075 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
121	1063.066	O_3
122	1063.181	O_3
123	1063.390	O_3
124	1063.468	O_3
125	1063.564	O_3
126	1063.643	O_3
127	1063.739	O_3
128	1063.837	O_3
129	1063.926	O_3
130	1064.037	O_3
131	1064.146	O_3
132	1064.259	O_3
133	1064.368	O_3
134	1064.482	O_3, CO_2
135	1064.583	O_3
136	1064.673	O_3
137	1064.760	O_3
138	1064.895	O_3
139	1064.969	O_3
140	1065.044	O_3, CO_2
141	1065.147	O_3
142	1065.216	O_3
143	1065.357	O_3
144	1065.441	O_3
145	1065.508	O_3?
146	1065.640	O_3
147	1065.790	O_3
148	1065.844	O_3
149	1065.948	O_3
150	1066.029	O_3, CO_2

Seq. No.	ν(observed) (cm^{-1})	Identification
151	1066.153	H_2O, O_3
152	1066.244	O_3
153	1066.386	O_3, H_2O
154	1066.491	O_3, H_2O
155	1066.622	O_3
156	1066.715	O_3
157	1066.793	O_3
158	1066.900	O_3
159	1066.982	O_3
160	1067.085	O_3
161	1067.143	O_3
162	1067.324	O_3
163	1067.425	O_3
164	1067.530	CO_2, O_3
165	1067.589	O_3
166	1067.718	O_3
167	1067.865	O_3
168	1068.005	O_3
169	1068.092	O_3
170	1068.178	O_3
171	1068.263	O_3
172	1068.355	O_3, CO_2
173	1068.448	O_3
174	1068.576	O_3
175	1068.664	O_3?
176	1068.755	O_3
177	1068.822	O_3+?
178	1069.009	CO_2, O_3
179	1069.160	O_3
180	1069.305	O_3

FRAME 12 (1050-1075 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
181	1069.404	O_3+?
182	1069.468	O_3
183	1069.560	O_3
184	1069.633	O_3
185	1069.746	O_3
186	1069.844	O_3
187	1069.930	O_3, H_2O
188	1070.031	O_3
189	1070.162	O_3
190	1070.290	O_3
191	1070.457	CO_2, O_3
192	1070.535	O_3
193	1070.657	O_3
194	1070.751	O_3
195	1070.842	O_3
196	1070.935	O_3
197	1070.992	O_3
198	1071.099	O_3
199	1071.223	O_3
200	1071.335	O_3
201	1071.411	O_3
202	1071.518	O_3
203	1071.624	O_3
204	1071.696	O_3
205	1071.888	CO_2, O_3
206	1071.972	O_3
207	1072.064	H_2O*?
208	1072.193	O_3
209	1072.316	O_3
210	1072.443	O_3
211	1072.516	O_3
212	1072.638	H_2O, O_3
213	1072.785	O_3
214	1072.919	O_3, H_2O
215	1073.010	O_3
216	1073.145	O_3
217	1073.277	CO_2, O_3
218	1073.452	O_3
219	1073.613	O_3
220	1073.690	O_3
221	1073.789	O_3
222	1073.878	CO_2
223	1073.957	O_3, H_2O
224	1074.050	O_3
225	1074.174	O_3
226	1074.269	H_2O, O_3
227	1074.417	H_2O, O_3
228	1074.647	CO_2, O_3
229	1074.750	O_3
230	1074.925	O_3, H_2O

FRAME 13 (1075-1100 cm^{-1})

Seq. No.	ν(observed) (cm^{-1})	Identification
1	1075.002	O_3
2	1075.128	O_3
3	1075.277	O_3
4	1075.369	O_3, H_2O
5	1075.480	?
6	1075.590	O_3
7	1075.723	O_3
8	1075.823	O_3
9	1075.986	CO_2, O_3
10	1076.117	O_3, H_2O
11	1076.218	O_3
12	1076.387	O_3
13	1076.525	?
14	1076.661	O_3
15	1076.724	O_3
16	1076.821	O_3, CO_2
17	1076.927	O_3
18	1077.070	O_3
19	1077.184	O_3
20	1077.302	CO_2, O_3
21	1077.451	O_3
22	1077.566	CO_2+?
23	1077.686	O_3
24	1077.767	O_3
25	1077.838	O_3
26	1077.984	O_3
27	1078.083	O_3
28	1078.179	O_3
29	1078.[illegible]	O_3, CO_2
30	1078.38[illegible]	O_3
31	1078.594	CO_2, O_3
32	1078.768	O_3
33	1078.863	O_3
34	1078.926	O_3
35	1079.008	CO_2, O_3
36	1079.091	O_3
37	1079.205	O_3
38	1079.307	?
39	1079.412	O_3
40	1079.574	O_3
41	1079.655	O_3, CO_2
42	1079.857	CO_2, O_3
43	1080.025	O_3
44	1080.108	O_3
45	1080.235	O_3
46	1080.348	O_3
47	1080.478	O_3
48	1080.586	O_3
49	1080.708	O_3
50	1080.786	O_3
51	1080.920	O_3
52	1081.090	CO_2, O_3
53	1081.228	O_3
54	108[illegible] 29	O_3, H_2O
55	1081.387	O_3
56	1081.515	O_3
57	1081.617	O_3, H_2O
58	1081.730	O_3
59	1081.876	O_3
60	1082.008	O_3

FRAME 13 (1075-1100 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
61	1082.301	CO_2, O_3
62	1082.429	O_3
63	1082.590	O_3
64	1082.694	O_3
65	1082.796	O_3
66	1082.877	O_3
67	1082.963	O_3
68	1083.054	O_3
69	1083.137	O_3+?
70	1083.249	O_3
71	1083.483	CO_2, O_3
72	1083.754	O_3
73	1083.898	O_3
74	1083.980	O_3
75	1084.095	O_3
76	1084.253	O_3
77	1084.324	O_3
78	1084.461	O_3
79	1084.534	O_3
80	1084.634	CO_2
81	1084.704	O_3
82	1084.805	H_2O
83	1084.997	O_3
84	1085.115	O_3
85	1085.437	H_2O
86	1085.536	O_3
87	1085.768	CO_2, O_3
88	1085.930	O_3
89	1086.074	O_3
90	1086.176	O_3
91	1086.359	O_3
92	1086.463	O_3
93	1086.568	O_3
94	1086.659	O_3?
95	1086.769	O_3
96	1086.871	CO_2
97	1087.022	O_3
98	1087.108	O_3
99	1087.186	O_3
100	1087.315	O_3
101	1087.405	O_3
102	1087.490	O_3
103	1087.584	O_3
104	1087.753	O_3
105	1087.955	O_3, CO_2, H_2O
106	1088.115	O_3
107	1088.218	O_3
108	1088.303	O_3
109	1088.399	O_3
110	1088.477	O_3?
111	1088.553	O_3?
112	1088.669	O_3
113	1088.825	O_3
114	1089.000	CO_2, O_3
115	1089.110	O_3
116	1089.222	O_3
117	1089.330	O_3
118	1089.500	O_3
119	1089.647	O_3
120	1089.742	O_3

FRAME 13 (1075-1100 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
121	1089.921	O_3
122	1090.018	CO_2, O_3
123	1090.058	O_3
124	1090.238	O_3
125	1090.366	?+O_3
126	1090.469	O_3
127	1090.584	?
128	1090.649	?
129	1090.788	O_3
130	1090.907	O_3
131	1091.038	O_3, CO_2
132	1091.204	H_2O, O_3
133	1091.289	O_3
134	1091.495	O_3
135	1091.608	O_3
136	1091.746	O_3
137	1091.843	O_3
138	1091.959	O_3
139	1092.014	CO_2, O_3
140	1092.121	O_3
141	1092.219	O_3
142	1092.316	O_3
143	1092.409	O_3
144	1092.551	O_3
145	1092.649	O_3
146	1092.751	O_3
147	1092.839	?
148	1092.937	O_3
149	1092.996	O_3
150	1093.087	O_3
151	1093.203	O_3
152	1093.335	O_3
153	1093.418	O_3
154	1093.508	O_3
155	1093.597	H_2O, O_3
156	1093.676	H_2O
157	1093.779	O_3
158	1093.878	O_3
159	1093.949	O_3
160	1094.015	O_3
161	1094.196	O_3
162	1094.412	O_3
163	1094.560	O_3
164	1094.657	O_3
165	1094.716	O_3
166	1094.776	O_3+?
167	1094.853	O_3
168	1094.949	O_3
169	1095.101	O_3
170	1095.199	?
171	1095.290	O_3?
172	1095.431	O_3
173	1095.505	O_3
174	1095.619	O_3, CO_2
175	1095.708	O_3
176	1095.766	O_3?
177	1095.861	O_3
178	1096.028	O_3
179	1096.100	O_3
180	1096.187	O_3

FRAME 13 (1075-1100 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
181	1096.282	?
182	1096.371	O_3
183	1096.448	O_3
184	1096.560	O_3
185	1096.649	O_3
186	1096.803	O_3
187	1096.905	?
188	1096.967	O_3?
189	1097.069	O_3
190	1097.198	O_3
191	1097.327	O_3
192	1097.400	O_3
193	1097.507	O_3
194	1097.605	O_3
195	1097.709	?
196	1097.850	O_3
197	1097.963	O_3
198	1098.113	O_3
199	1098.238	O_3
200	1098.375	O_3
201	1098.532	O_3
202	1098.681	O_3
203	1098.751	O_3
204	1098.804	O_3
205	1098.890	O_3
206	1098.980	O_3
207	1099.138	O_3
208	1099.246	O_3
209	1099.331	O_3
210	1099.427	O_3
211	1099.676	H_2O, O_3
212	1099.915	O_3

FRAME 14 (1100-1125 cm^{-1})

Seq. No.	ν(observed) (cm^{-1})	Identification
1	1100.081	O_3
2	1100.258	O_3
3	1100.421	O_3
4	1100.573	O_3 +?
5	1100.655	O_3
6	1100.742	O_3
7	1100.845	O_3?
8	1100.983	O_3
9	1101.025	O_3
10	1101.132	?
11	1101.244	O_3
12	1101.447	H_2O
13	1101.787	O_3
14	1101.941	O_3
15	1102.031	O_3
16	1102.131	O_3
17	1102.232	O_3
18	1102.300	O_3
19	1102.371	O_3
20	1102.478	O_3
21	1102.611	O_3, H_2O
22	1102.773	O_3, H_2O
23	1102.990	O_3 +?
24	1103.090	?
25	1103.198	O_3
26	1103.316	O_3
27	1103.419	O_3
28	1103.501	O_3
29	1103.595	?
30	1103.710	O_3
31	1103.845	O_3
32	1103.947	O_3
33	1104.064	O_3
34	1104.194	O_3
35	1104.358	O_3
36	1104.523	O_3
37	1104.629	O_3
38	1104.672	O_3
39	1104.740	?
40	1104.843	O_3
41	1104.963	O_3
42	1105.053	O_3
43	1105.110	O_3
44	1105.222	O_3
45	1105.290	O_3
46	1105.377	O_3
47	1105.479	O_3
48	1105.578	?
49	1105.704	O_3
50	1105.797	O_3?
51	1105.897	?
52	1106.020	O_3
53	1106.102	O_3
54	1106.234	O_3
55	1106.345	O_3
56	1106.524	O_3
57	1106.741	H_2O, O_3
58	1106.979	O_3
59	1107.097	O_3
60	1107.175	O_3

FRAME 14 (1100-1125 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
61	1107.301	O_3
62	1107.399	O_3
63	1107.504	O_3
64	1107.593	O_3
65	1107.710	O_3
66	1107.920	O_3
67	1108.035	O_3
68	1108.125	O_3
69	1108.248	O_3
70	1108.356	H_2O?
71	1108.455	O_3
72	1108.570	O_3
73	1108.659	O_3, H_2O
74	1108.757	O_3 +?
75	1108.846	O_3
76	1108.926	O_3?
77	1109.036	O_3
78	1109.111	O_3?
79	1109.164	?
80	1109.271	O_3
81	1109.383	O_3
82	1109.477	O_3 +?
83	1109.584	O_3
84	1109.672	O_3
85	1109.743	O_3
86	1109.807	O_3
87	1109.971	O_3
88	1110.117	O_3
89	1110.207	?
90	1110.366	O_3, H_2O
91	1110.523	O_3
92	1110.669	O_3
93	1110.743	?
94	1110.834	O_3
95	1110.990	O_3, H_2O
96	1111.060	O_3
97	1111.253	O_3
98	1111.509	H_2O
99	1111.725	O_3
100	1111.834	O_3
101	1111.949	?
102	1112.036	O_3
103	1112.125	?
104	1112.183	?
105	1112.292	O_3
106	1112.409	O_3
107	1112.501	O_3
108	1112.690	O_3
109	1112.827	O_3
110	1112.917	O_3
111	1113.126	O_3
112	1113.232	O_3
113	1113.366	O_3
114	1113.457	O_3
115	1113.572	O_3
116	1113.664	O_3
117	1113.766	O_3
118	1113.846	O_3
119	1113.943	O_3
120	1114.019	O_3

FRAME 14 (1100-1125 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
121	1114.118	O_3
122	1114.208	O_3
123	1114.355	O_3
124	1114.454	O_3
125	1114.625	O_3, H_2O
126	1114.721	?
127	1114.825	O_3
128	1114.995	O_3
129	1115.081	O_3
130	1115.174	O_3
131	1115.287	O_3
132	1115.400	O_3
133	1115.569	O_3
134	1115.674	O_3
135	1115.781	O_3
136	1115.933	O_3 +?
137	1116.059	O_3
138	1116.183	O_3
139	1116.316	O_3?
140	1116.420	O_3
141	1116.484	O_3
142	1116.615	O_3?
143	1116.704	O_3
144	1116.811	O_3
145	1116.972	O_3
146	1117.081	O_3
147	1117.173	O_3
148	1117.275	O_3
149	1117.373	O_3
150	1117.464	?
151	1117.590	H_2O, O_3
152	1117 765	O_3
153	1117.870	O_3
154	1118.044	O_3
155	1118.152	O_3 +?
156	1118.246	?
157	1118.336	O_3
158	1118.435	O_3
159	1118.558	O_3
160	1118.689	O_3
161	1118.812	O_3
162	1118.948	O_3
163	1119.054	O_3
164	1119.162	O_3
165	1119.284	O_3
166	1119.451	O_3
167	1119.578	O_3
168	1119.686	O_3 +?
169	1119.799	O_3
170	1119.890	O_3
171	1120.049	O_3
172	1120.215	O_3
173	1120.353	O_3
174	1120.565	O_3
175	1120.791	H_2O, O_3
176	1120.873	O_3
177	1121.22	H_2O
178	1121.445	O_3
179	1121.563	O_3
180	1121.652	O_3

FRAME 14 (1100-1125 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
181	1121.793	O_3
182	1121.895	?
183	1122.057	O_3
184	1122.173	O_3
185	1122.293	O_3
186	1122.405	O_3
187	1122.462	O_3
188	1122.542	O_3
189	1122.643	O_3
190	1122.703	O_3
191	1122.779	O_3?
192	1122.883	O_3
193	1123.001	O_3
194	1123.101	?
195	1123.228	O_3
196	1123.333	O_3
197	1123.422	O_3
198	1123.562	O_3
199	1123.656	O_3, CH_4
200	1123.775	O_3
201	1123.846	H_2O, O_3
202	1123.948	O_3
203	1124.082	O_3
204	1124.185	O_3
205	1124.311	O_3
206	1124.437	O_3
207	1124.653	O_3
208	1124.734	O_3
209	1124.884	O_3
210	1124.970	O_3

FRAME 15 (1125-1150 cm^{-1})

Seq. No.	ν(observed) (cm^{-1})	Identification
1	1125.046	O_3
2	1125.210	O_3
3	1125.305	O_3
4	1125.355	O_3
5	1125.417	O_3
6	1125.527	O_3
7	1125.632	O_3?
8	1125.792	H_2O, O_3, N_2O
9	1125.908	O_3
10	1126.026	O_3
11	1126.085	O_3
12	1126.252	O_3
13	1126.352	?
14	1126.433	O_3
15	1126.547	N_2O, O_3
16	1126.675	O_3
17	1126.780	O_3
18	1126.892	H_2O, N_2O, O_3
19	1127.003	O_3
20	1127.128	O_3
21	1127.236	O_3
22	1127.321	O_3?
23	1127.410	O_3
24	1127.494	O_3
25	1127.637	N_2O
26	1127.738	O_3
27	1127.962	O_3
28	1128.073	O_3
29	1128.162	N_2O, O_3
30	1128.305	O_3
31	1128.442	O_3
32	1128.524	?
33	1128.577	O_3
34	1128.653	?
35	1128.753	O_3
36	1128.870	O_3
37	1128.995	O_3
38	1129.115	N_2O?
39	1129.233	O_3
40	1129.428	O_3
41	1129.519	O_3
42	1129.575	O_3
43	1129.706	N_2O, O_3
44	1129.805	N_2O, O_3, H_2O
45	1129.918	O_3
46	1130.029	O_3?
47	1130.130	O_3
48	1130.252	O_3
49	1130.353	O_3
50	1130.451	O_3, N_2O
51	1130.554	O_3
52	1130.744	O_3
53	1130.873	O_3
54	1130.954	O_3
55	1131.113	O_3
56	1131.269	N_2O, O_3
57	1131.343	O_3
58	1131.448	N_2O, O_3
59	1131.535	?
60	1131.650	O_3

FRAME 15 (1125-1150 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
61	1131.781	O_3
62	1131.912	H_2O?
63	1132.024	O_3, N_2O
64	1132.118	?
65	1132.214	N_2O, O_3
66	1132.305	O_3
67	1132.437	O_3
68	1132.496	?
69	1132.619	O_3
70	1132.797	O_3
71	1132.899	?
72	1132.984	N_2O, O_3
73	1133.048	H_2O, N_2O, O_3
74	1133.236	O_3
75	1133.327	H_2O?
76	1133.435	O_3
77	1133.669	O_3, N_2O
78	1133.828	?
79	1133.864	N_2O
80	1134.021	O_3
81	1134.167	H_2O
82	1134.252	O_3
83	1134.359	N_2O
84	1134.461	O_3
85	1134.528	O_3
86	1134.660	N_2O, O_3
87	1134.779	O_3
88	1134.893	O_3
89	1135.093	O_3
90	1135.183	O_3
91	1135.328	O_3
92	1135.542	H_2O, O_3
93	1135.75	H_2O, O_3
94	1136.104	O_3
95	1136.201	O_3
96	1136.287	O_3
97	1136.368	O_3
98	1136.480	O_3
99	1136.525	O_3
100	1136.643	O_3
101	1136.732	O_3
102	1136.852	O_3
103	1136.952	O_3
104	1137.133	O_3
105	1137.230	O_3
106	1137.43	H_2O, O_3, N_2O
107	1137.733	O_3
108	1137.863	O_3
109	1137.954	N_2O
110	1138.036	O_3
111	1138.148	?
112	1138.255	O_3, N_2O
113	1138.360	O_3
114	1138.442	O_3
115	1138.525	O_3
116	1138.611	O_3
117	1138.710	O_3
118	1138.870	O_3
119	1139.043	O_3, N_2O
120	1139.160	N_2O

FRAME 15 (1125-1150 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
121	1139.280	O_3
122	1139.415	O_3
123	1139.497	O_3
124	1139.588	O_3, N_2O
125	1139.703	O_3
126	1139.817	N_2O
127	1139.986	O_3, N_2O
128	1140.124	H_2O
129	1140.248	O_3
130	1140.435	O_3, N_2O
131	1140.567	O_3
132	1140.736	N_2O
133	1140.841	?
134	1140.946	O_3
135	1141.056	O_3
136	1141.155	O_3
137	1141.232	N_2O
138	1141.365	N_2O, O_3
139	1141.526	H_2O, O_3, N_2O
140	1141.627	O_3
141	1141.721	?
142	1141.760	O_3?
143	1141.878	O_3
144	1141.994	O_3
145	1142.082	O_3, N_2O
146	1142.177	N_2O, O_3
147	1142.318	N_2O
148	1142.434	O_3
149	1142.610	O_3
150	1142.683	O_3
151	1142.777	O_3
152	1142.858	N_2O, O_3
153	1142.972	N_2O, O_3
154	1143.076	O_3
155	1143.159	O_3
156	1143.299	O_3
157	1143.447	O_3
158	1143.594	O_3
159	1143.747	N_2O, O_3
160	1143.822	O_3
161	1143.917	N_2O
162	1144.015	O_3
163	1144.124	O_3?
164	1144.183	O_3
165	1144.288	O_3
166	1144.378	O_3
167	1144.432	O_3?
168	1144.535	N_2O, O_3
169	1144.633	O_3
170	1144.730	N_2O
171	1144.837	O_3
172	1144.951	O_3
173	1145.036	O_3
174	1145.116	O_3
175	1145.216	O_3
176	1145.331	N_2O
177	1145.447	O_3
178	1145.576	O_3
179	1145.671	O_3
180	1145.740	O_3

FRAME 15 (1125-1150 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
181	1145.834	O_3?
182	1145.945	O_3
183	1146.029	H_2O
184	1146.128	N_2O
185	1146.265	O_3
186	1146.361	N_2O?
187	1146.471	O_3
188	1146.568	?
189	1146.674	O_3
190	1146.783	O_3
191	1146.920	N_2O
192	1147.055	O_3
193	1147.186	O_3
194	1147.299	?
195	1147.407	O_3
196	1147.513	O_3
197	1147.614	O_3
198	1147.720	N_2O
199	1147.867	O_3
200	1147.957	N_2O, CH_4
201	1148.048	O_3
202	1148.153	O_3
203	1148.339	O_3?
204	1148.462	O_3
205	1148.504	N_2O
206	1148.635	N_2O, O_3
207	1148.742	N_2O, O_3
208	1148.916	O_3
209	1149.313	N_2O
210	1149.45	H_2O, O_3
211	1149.655	O_3
212	1149.882	O_3
213	1149.971	O_3

FRAME 16 (1150-1175 cm^{-1})

Seq. No.	ν(observed) (cm^{-1})	Identification
1	1150.106	N_2O
2	1150.207	O_3
3	1150.345	O_3
4	1150.495	O_3
5	1150.611	O_3, H_2O?
6	1150.698	O_3?
7	1150.912	N_2O
8	1151.036	O_3
9	1151.130	N_2O
10	1151.182	N_2O
11	1151.342	O_3
12	1151.546	H_2O
13	1151.715	N_2O, O_3
14	1151.972	N_2O
15	1152.177	O_3
16	1152.48	H_2O, N_2O, O_3
17	1152.786	N_2O
18	1152.914	?
19	1153.011	O_3
20	1153.110	H_2O
21	1153.214	O_3, H_2O
22	1153.330	N_2O, O_3
23	1153.619	N_2O
24	1153.738	?
25	1153.839	O_3
26	1153.984	O_3
27	1154.139	N_2O, O_3
28	1154.346	?
29	1154.460	N_2O, H_2O
30	1154.534	O_3
31	1154.613	O_3
32	1154.670	H_2O, O_3
33	1154.775	?
34	1154.948	N_2O
35	1155.194	O_3
36	1155.288	N_2O
37	1155.406	O_3?
38	1155.516	O_3
39	1155.759	N_2O, O_3
40	1155.945	O_3
41	1156.034	O_3?
42	1156.125	N_2O, O_3
43	1156.253	O_3
44	1156.347	O_3
45	1156.568	N_2O
46	1156.672	O_3
47	1156.827	?
48	1156.944	O_3, N_2O
49	1157.067	?
50	1157.188	O_3
51	1157.381	N_2O
52	1157.511	O_3
53	1157.690	O_3
54	1157.790	N_2O
55	1157.895	O_3
56	1158.007	O_3
57	1158.194	N_2O, O_3
58	1158.363	O_3
59	1158.485	N_2O, O_3
60	1158.619	N_2O

FRAME 16 (1150-1175 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
61	1158.747	O_3
62	1158.836	O_3
63	1159.010	N_2O
64	1159.218	O_3
65	1159.343	CH_4
66	1159.444	O_3
67	1159.566	O_3, CH_4
68	1159.657	O_3
69	1159.746	O_3
70	1159.836	N_2O
71	1160.046	O_3
72	1160.176	?
73	1160.308	O_3, CH_4, N_2O
74	1160.500	O_3
75	1160.656	N_2O, O_3
76	1160.910	CF_2Cl_2, O_3, CH_4
77	1161.030	CF_2Cl_2
78	1161.182	O_3
79	1161.283	O_3
80	1161.479	N_2O
81	1161.740	O_3, H_2O
82	1161.912	O_3
83	1162.089	O_3
84	1162.307	N_2O
85	1162.484	O_3
86	1162.585	O_3, H_2O
87	1162.692	O_3
88	1162.784	O_3, N_2O
89	1162.912	O_3
90	1163.016	H_2O, O_3
91	1163.132	N_2O
92	1163.321	O_3
93	1163.425	O_3
94	1163.573	O_3
95	1163.702	O_3, H_2O
96	1163.963	N_2O
97	1164.161	O_3?
98	1164.257	O_3
99	1164.365	?
100	1164.433	?
101	1164.527	O_3, N_2O, CH_4
102	1164.794	N_2O
103	1165.052	H_2O, O_3
104	1165.37	H_2O
105	1165.625	N_2O
106	1165.938	H_2O, O_3
107	1166.106	O_3
108	1166.242	N_2O, O_3
109	1166.335	O_3
110	1166.465	N_2O
111	1166.602	O_2
112	1166.657	?
113	1166.762	O_3
114	1166.911	O_3, H_2O
115	1167.039	N_2O, O_3, H_2O
116	1167.100	O_3, N_2O
117	1167.292	N_2O, O_3
118	1167.476	?
119	1167.586	O_3
120	1167.692	O_3 +?

FRAME 16 (1150-1175 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
121	1167.801	O_3?
122	1167.853	N_2O?
123	1167.958	O_3, N_2O
124	1168.075	N_2O, O_3
125	1168.149	O_3
126	1168.266	CH_4, O_3
127	1168.320	O_3?
128	1168.423	O_3 +?
129	1168.572	?
130	1168.723	N_2O, O_3
131	1168.826	O_3, N_2O
132	1168.972	N_2O
133	1169.081	O_3
134	1169.136	H_2O
135	1169.239	O_3, H_2O
136	1169.340	O_3, CH_4
137	1169.450	CH_4
138	1169.584	O_3, N_2O
139	1169.686	O_3, N_2O
140	1169.814	N_2O
141	1170.032	O_3, H_2O
142	1170.191	CH_4, O_3
143	1170.296	O_3?
144	1170.430	CH_4, N_2O, O_3
145	1170.549	O_3, N_2O
146	1170.654	N_2O
147	1170.756	O_3
148	1170.870	O_3, CH_4, H_2O
149	1171.077	?
150	1171.274	N_2O
151	1171.407	N_2O, O_3
152	1171.507	N_2O, H_2O, O_3
153	1171.666	O_3, H_2O
154	1171.762	O_3
155	1171.885	O_3
156	1172.022	O_3
157	1172.131	N_2O, O_3
158	1172.259	O_3, N_2O
159	1172.350	N_2O
160	1172.471	O_3
161	1172.588	O_3, CH_4
162	1172.704	O_3, H_2O?
163	1172.820	O_3
164	1173.002	O_3, N_2O
165	1173.093	O_3
166	1173.196	N_2O
167	1173.295	O_3
168	1173.387	H_2O
169	1173.714	H_2O, O_3
170	1173.928	O_3, H_2O
171	1174.055	N_2O, O_3
172	1174.350	} H_2O
173	1174.715	
174	1174.893	N_2O, O_3

FRAME 17 (1175-1200 cm^{-1})

Seq. No.	ν(observed) (cm^{-1})	Identification
1	1175.189	O_3
2	1175.326	O_3
3	1175.504	N_2O
4	1175.612	O_3
5	1175.758	N_2O
6	1175.883	O_3
7	1176.007	O_3?
8	1176.106	O_3
9	1176.200	CH_4
10	1176.417	H_2O, O_3, N_2O
11	1176.614	N_2O
12	1176.911	O_3
13	1176.991	O_3, H_2O
14	1177.099	O_3
15	1177.238	O_3, N_2O, H_2O
16	1177.471	N_2O
17	1177.775	CH_4, O_3
18	1177.877	CH_4, O_3
19	1177.965	O_3
20	1178.084	O_3, N_2O
21	1178.161	O_3
22	1178.328	N_2O
23	1178.675	H_2O, O_3
24	1178.757	O_3
25	1178.905	O_3, N_2O
26	1178.994	?
27	1179.190	N_2O
28	1179.329	N_2O, CH_4
29	1179.409	O_3
30	1179.498	O_3
31	1179.624	O_3
32	1179.718	O_3
33	1179.813	CH_4, N_2O
34	1180.052	N_2O
35	1180.246	O_3, N_2O, H_2O
36	1180.390	O_3, H_2O?
37	1180.504	O_3
38	1180.669	N_2O, O_3
39	1180.828	H_2O
40	1180.915	N_2O
41	1181.092	N_2O, CH_4
42	1181.186	O_3, N_2O
43	1181.323	O_3, CH_4
44	1181.429	?
45	1181.523	CH_4, N_2O
46	1181.623	O_3
47	1181.778	N_2O, CH_4
48	1181.887	O_3
49	1181.980	N_2O
50	1182.106	CH_4
51	1182.190	O_3
52	1182.352	N_2O
53	1182.480	O_3
54	1182.648	N_2O
55	1182.893	O_3, N_2O
56	1183.052	O_3
57	1183.200	N_2O, O_3
58	1183.517	N_2O
59	1183.663	O_3
60	1183.778	N_2O

FRAME 17 (1175-1200 cm^{-1}) Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
61	1183.886	O_3
62	1184.101	H_2O, N_2O
63	1184.244	O_3
64	1184.386	N_2O
65	1184.592	O_3
66	1184.707	O_3, N_2O
67	1184.815	O_3
68	1184.929	N_2O
69	1185.057	CH_4
70	1185.148	O_3
71	1185.257	N_2O
72	1185.375	O_3
73	1185.541	H_2O, O_3
74	1185.698	H_2O, CH_4
75	1185.881	O_3
76	1186.007	O_3, CH_4
77	1186.130	N_2O
78	1186.374	O_3
79	1186.500	N_2O, O_3
80	1186.901	H_2O, N_2O
81	1187.160	
82	1187.533	N_2O, O_3
83	1187.878	N_2O
84	1187.974	O_3
85	1188.069	O_3
86	1188.185	H_2O
87	1188.271	N_2O, O_3
88	1188.382	CH_4, N_2O
89	1188.512	O_3
90	1188.601	O_3
91	1188.757	N_2O
92	1188.954	CH_4, O_3
93	1189.104	O_3
94	1189.197	N_2O, H_2O
95	1189.308	O_3
96	1189.386	?
97	1189.487	O_3
98	1189.634	N_2O
99	1189.729	O_3?
100	1189.838	H_2O?
101	1189.928	CH_4
102	1190.095	N_2O, O_3
103	1190.230	CH_4
104	1190.375	H_2O, O_3
105	1190.514	N_2O
106	1190.743	CH_4
107	1190.887	CH_4, O_3
108	1190.974	CH_4, N_2O
109	1191.167	H_2O, O_3
110	1191.400	N_2O
111	1191.476	CH_4, H_2O
112	1191.663	?
113	1191.809	N_2O
114	1191.927	H_2O, N_2O, O_3
115	1192.067	CH_4
116	1192.162	O_3
117	1192.272	N_2O
118	1192.441	O_3
119	1192.707	H_2O
120	1192.827	CH_4

FRAME 17 (1175-1200 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
121	1192.976	O_3
122	1193.157	N_2O
123	1193.303	O_3
124	1193.513	H_2O
125	1193.748	N_2O, O_3
126	1193.816	CH_4
127	1194.040	N_2O
128	1194.210	O_3
129	1194.335	?
130	1194.405	N_2O +?
131	1194.528	O_3
132	1194.657	N_2O, O_3
133	1194.759	?
134	1194.933	N_2O, CH_4
135	1195.240	N_2O
136	1195.336	H_2O, O_3
137	1195.472	O_3
138	1195.569	N_2O
139	1195.718	O_3
140	1195.810	N_2O
141	1195.898	?
142	1196.120	CH_4, N_2O
143	1196.204	H_2O
144	1196.316	CH_4
145	1196.415	CH_4, O_3
146	1196.486	CH_4, N_2O
147	1196.695	N_2O
148	1196.844	O_3
149	1196.949	N_2O, CH_4
150	1197.025	CH_4
151	1197.130	H_2O
152	1197.210	O_3
153	1197.292	O_3
154	1197.391	CH_4, N_2O
155	1197.585	N_2O
156	1198.20	H_2O
157	1198.451	N_2O
158	1198.565	CH_4, H_2O
159	1198.667	N_2O, O_3
160	1198.999	CH_4
161	1199.079	H_2O
162	1199.360	N_2O
163	1199.475	O_3
164	1199.590	H_2O, O_3
165	1199.691	CH_4
166	1199.868	CH_4
167	1199.983	O_3

FRAME 18 (1200-1225 cm^{-1})

Seq. No.	ν(observed) (cm^{-1})	Identification
1	1200.086	O_3
2	1200.149	O_3, N_2O
3	1200.247	N_2O
4	1200.347	N_2O?
5	1200.494	O_3?
6	1200.574	O_3
7	1200.701	O_3, CH_4
8	1200.791	O_3, CH_4, H_2O
9	1201.027	O_3?
10	1201.133	CH_4, N_2O
11	1201.469	H_2O
12	1201.640	CH_4
13	1201.759	CH_4, O_3
14	1201.869	?
15	1202.026	N_2O
16	1202.185	O_3
17	1202.255	O_3
18	1202.420	CH_4
19	1202.521	O_3
20	1202.624	O_3
21	1202.722	CH_4
22	1202.917	N_2O
23	1203.037	CH_4
24	1203.180	CH_4
25	1203.287	O_3
26	1203.387	CH_4, H_2O
27	1203.584	CH_4, H_2O
28	1203.688	CH_4
29	1203.806	N_2O
30	1203.924	H_2O
31	1204.031	CH_4
32	1204.137	O_3?
33	1204.193	O_3
34	1204.317	CH_4 +?
35	1204.603	O_3
36	1204.699	N_2O
37	1204.767	O_3, CH_4
38	1204.871	O_3
39	1205.073	H_2O
40	1205.259	?
41	1205.382	O_3, CH_4
42	1205.525	O_3
43	1205.597	N_2O
44	1205.799	?
45	1205.929	CH_4
46	1206.031	H_2O, CH_4
47	1206.367	H_2O
48	1206.476	N_2O
49	1206.687	O_3
50	1206.797	O_3
51	1206.928	O_3
52	1207.100	O_3
53	1207.278	H_2O
54	1207.374	N_2O
55	1207.605	N_2O, O_3?
56	1207.719	O_3
57	1207.833	CH_4
58	1207.921	?
59	1208.053	O_3
60	1208.163	?

FRAME 18 (1200-1225 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
61	1208.270	N_2O
62	1208.449	H_2O, O_3
63	1208.755	H_2O
64	1209.138	N_2O, O_3
65	1209.261	H_2O, O_3
66	1209.583	?
67	1209.697	CH_4
68	1209.806	CH_4
69	1209.914	CH_4
70	1210.004	CH_4
71	1210.072	CH_4, N_2O
72	1210.183	H_2O
73	1210.291	N_2O
74	1210.675	CH_4
75	1210.779	CH_4
76	1211.25	H_2O, CH_4
77	1211.685	CH_4 +?
78	1211.889	CH_4
79	1212.002	} H_2O, CH_4
80	1212.393	
81	1213.003	H_2O
82	1213.426	?
83	1213.542	CH_4
84	1213.635	N_2O
85	1213.700	O_3, CH_4?
86	1213.825	O_3?
87	1213.927	N_2O
88	1214.052	CH_4
89	1214.282	?
90	1214.367	CH_4
91	1214.526	N_2O
92	1214.687	CH_4
93	1214.955	H_2O
94	1215.484	H_2O
95	1215.632	H_2O, CH_4
96	1215.851	O_3
97	1215.951	CH_4
98	1216.204	CH_4, H_2O
99	1216.321	CH_4
100	1216.629	CH_4
101	1216.867	CH_4?
102	1216.961	N_2O?
103	1217.073	CH_4?
104	1217.285	H_2O
105	1217.387	O_3 +?
106	1217.626	CH_4
107	1217.990	CH_4
108	1218.52	H_2O, CH_4
109	1219.141	H_2O*, CH_4
110	1219.250	N_2O
111	1219.650	CH_4
112	1219.945	H_2O
113	1220.192	CH_4
114	1220.341	H_2O, CH_4
115	1220.741	H_2O
116	1220.857	CH_4
117	1221.047	H_2O
118	1221.377	CH_4 +?
119	1221.471	CH_4
120	1221.877	CH_4, H_2O

FRAME 18 (1200-1225 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
121	1222.185	H_2O
122	1222.322	N_2O, CH_4
123	1222.457	H_2O, CH_4
124	1222.639	CH_4, H_2O
125	1222.909	CH_4
126	1223.155	CH_4
127	1223.356	CH_4, N_2O
128	1223.467	CH_4?
129	1223.649	N_2O
130	1223.768	H_2O
131	1223.985	CH_4
132	1224.243	?
133	1224.521	H_2O, N_2O
134	1224.909	H_2O
135	1225.244	

FRAME 19 (1225-1250 cm^{-1})

Seq. No.	ν(observed) (cm^{-1})	Identification
1	1225.548	H_2O, CH_4
2	1226.090	CH_4, H_2O
3	1226.542	N_2O
4	1226.654	H_2O
5	1226.871	H_2O, CH_4
6	1226.928	H_2O
7	1227.061	H_2O, N_2O, CH_4
8	1227.294	H_2O
9	1227.437	?
10	1227.540	H_2O, N_2O
11	1227.732	CH_4
12	1227.835	?
13	1227.957	N_2O
14	1228.116	CH_4
15	1228.309	CH_4
16	1228.532	?
17	1228.790	CH_4
18	1229.299	CH_4
19	1229.451	H_2O, CH_4
20	1229.659	N_2O
21	1229.982	CH_4
22	1230.082	CH_4
23	1230.286	CH_4
24	1230.510	N_2O, H_2O?
25	1230.613	CO_2
26	1230.711	CH_4, N_2O
27	1231.000	CH_4
28	1231.113	?
29	1231.250	CH_4
30	1231.354	N_2O, CO_2
31	1231.427	CH_4
32	1231.544	N_2O?
33	1231.702	N_2O
34	1231.780	CH_4
35	1231.995	?
36	1232.088	CH_4, CO_2
37	1232.200	N_2O
38	1232.407	CH_4, N_2O
39	1232.729	H_2O, N_2O
40	1232.838	CO_2
41	1232.940	CH_4
42	1233.037	N_2O
43	1233.158	H_2O
44	1233.287	H_2O*
45	1233.455	CH_4
46	1233.744	N_2O
47	1233.874	N_2O
48	1233.986	N_2O
49	1234.136	N_2O, CH_4
50	1234.225	CH_4
51	1234.317	CO_2, N_2O
52	1234.558	?
53	1234.755	N_2O +?
54	1234.860	CH_4
55	1234.970	CH_4
56	1235.058	CH_4, N_2O
57	1235.201	H_2O
58	1235.297	CH_4
59	1235.392	?
60	1235.554	CH_4, N_2O

FRAME 19 (1225-1250 cm^{-1}) Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
61	1235.813	N_2O, CH_4
62	1235.98	CH_4
63	1236.300	H_2O
64	1236.435	CH_4
65	1236.771	H_2O, N_2O
66	1237.071	CH_4, H_2O
67	1237.190	H_2O*?, N_2O
68	1237.300	CH_4, H_2O?
69	1237.519	H_2O
70	1237.690	CH_4
71	1237.810	N_2O
72	1238.019	CH_4
73	1238.137	?
74	1238.308	?
75	1238.496	CH_4
76	1238.72	CH_4, N_2O
77	1239.004	CH_4, N_2O
78	1239.213	H_2O
79	1239.497	CO_2, CH_4
80	1239.655	CH_4, N_2O
81	1239.814	N_2O
82	1239.992	H_2O, CH_4
83	1240.237	CO_2
84	1240.341	H_2O
85	1240.578	CH_4, H_2O, N_2O
86	1240.705	H_2O, CH_4
87	1240.826	N_2O
88	1240.99	CH_4
89	1241.275	N_2O
90	1241.341	H_2O +?
91	1241.508	N_2O, CH_4
92	1241.855	CH_4, N_2O
93	1241.947	CH_4
94	1242.241	H_2O
95	1242.458	CO_2, N_2O
96	1242.654	CH_4
97	1242.813	N_2O, H_2O
98	1243.020	H_2O, CH_4
99	1243.192	CO_2, H_2O
100	1243.350	CH_4
101	1243.806	H_2O, N_2O
102	1244.355	
103	1244.789	N_2O, H_2O
104	1245.213	CH_4
105	1245.414	CO_2
106	1245.78	CH_4, N_2O
107	1246.024	N_2O
108	1246.156	CO_2
109	1246.45	CH_4
110	1246.744	N_2O, H_2O, CH_4
111	1246.903	CO_2, N_2O
112	1247.176	?
113	1247.297	N_2O, CH_4
114	1247.660	CH_4, N_2O
115	1247.940	
116	1248.179	H_2O
117	1248.349	CO_2, CH_4
118	1248.449	H_2O, N_2O
119	1248.697	N_2O
120	1248.879	H_2O

FRAME 19 (1225-1250 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
121	1249.114	CO_2
122	1249.182	H_2O
123	1249.64	CH_4, N_2O
124	1249.833	CO_2
125	1249.992	CH_4

FRAME 20 (1250-1275 cm^{-1})

Seq. No.	ν(observed) (cm^{-1})	Identification
1	1250.484	N_2O, CH_4
2	1250.632	N_2O, CO_2
3	1250.832	H_2O
4	1251.344	H_2O, N_2O, CO_2
5	1251.596	N_2O
6	1251.867	CH_4
7	1252.058	CO_2
8	1252.343	H_2O, CH_4
9	1252.556	N_2O, CH_4
10	1252.792	CO_2
11	1253.110	N_2O
12	1253.363	} CH_4, N_2O, H_2O
13	1253.850	
14	1254.092	H_2O
15	1254.191	H_2O
16	1254.465	N_2O
17	1254.738	H_2O
18	1255.00	CH_4
19	1255.414	N_2O
20	1255.696	N_2O, CH_4
21	1255.797	H_2O
22	1255.959	H_2O
23	1256.070	CH_4
24	1256.163	CH_4, N_2O
25	1256.387	N_2O
26	1256.61	CH_4
27	1256.898	H_2O, N_2O
28	1257.086	H_2O
29	1257.32	N_2O, H_2O
30	1257.600	H_2O, CH_4
31	1257.941	CO_2
32	1258.060	CH_4
33	1258.27	N_2O
34	1258.60	H_2O
35	1258.902	H_2O
36	1259.21	N_2O
37	1259.514	} CH_4, H_2O , N_2O
38	1261.167	
39	1261.346	N_2O
40	1261.65	CH_4
41	1261.950	} N_2O, CH_4
42	1262.224	
43	1262.484	N_2O
44	1262.90	N_2O
45	1263.33	CH_4
46	1263.93	N_2O, H_2O
47	1264.253	N_2O, CH_4
48	1264.367	CH_4
49	1264.77	N_2O
50	1265.268	} CH_4, H_2O, N_2O
51	1266.122	
52	1266.60	N_2O, H_2O
53	1267.139	N_2O
54	1267.388	} N_2O, CH_4, H_2O
55	1272.814	
56	1273.192	N_2O
57	1273.310	H_2O
58	1273.66	N_2O, H_2O
59	1274.009	CH_4
60	1274.096	N_2O

FRAME 20 (1250-1275 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
61	1274.61	N_2O

FRAME 21 (1275-1300 cm^{-1})

Seq. No.	ν(observed) (cm^{-1})	Identification
1	1275.05	CH_4, N_2O
2	1275.304	N_2O, CH_4
3	1275.576	
4	1275.775	CH_4
5	1275.904	N_2O
6	1276.36	N_2O
7	1276.630	H_2O
8	1276.82	CH_4, N_2O
9	1277.168	N_2O, CH_4
10	1277.551	
11	1277.675	N_2O
12	1277.809	N_2O, CO_2
13	1278.09	N_2O
14	1278.568	N_2O
15	1278.97	N_2O
16	1279.237	CO_2
17	1279.454	N_2O, CH_4
18	1279.673	H_2O, N_2O, CH_4
19	1280.144	
20	1280.343	N_2O
21	1280.63	N_2O, H_2O
22	1280.907	H_2O, N_2O
23	1281.183	CH_4, N_2O, H_2O
24	1281.421	CH_4, N_2O
25	1281.699	
26	1281.800	H_2O
27	1282.085	N_2O, H_2O
28	1282.38	N_2O
29	1282.588	CH_4, N_2O
30	1283.834	
31	1284.066	H_2O, N_2O
32	1284.400	
33	1284.688	N_2O
34	1284.906	H_2O
35	1285.172	H_2O, CH_4
36	1285.303	CH_4, N_2O
37	1285.423	N_2O
38	1285.557	N_2O
39	1285.737	N_2O
40	1286.01	H_2O
41	1286.433	N_2O
42	1286.55	N_2O, CH_4, H_2O
43	1286.794	CH_4
44	1286.909	N_2O
45	1286.99?	H_2O
46	1287.115	N_2O, H_2O, CH_4
47	1289.175	
48	1289.304	N_2O?
49	1289.413	N_2O?
50	1289.80	N_2O, CH_4
51	1290.111	H_2O, CH_4, N_2O
52	1290.436	H_2O, N_2O, CH_4
53	1290.752	
54	1291.095	N_2O
55	1291.49	N_2O
56	1291.905	CH_4, N_2O, H_2O
57	1292.014	H_2O, N_2O
58	1292.31	N_2O, H_2O, CH_4
59	1292.63	CH_4
60	1292.827	H_2O, CH_4

FRAME 21 (1275-1300 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
61	1293.09	N_2O
62	1293.34	H_2O, CH_4
63	1293.440	CH_4
64	1293.537	H_2O, CH_4
65	1293.646	CH_4, N_2O
66	1293.92	N_2O, H_2O, CH_4
67	1294.209	CH_4, N_2O
68	1294.37	CH_4
69	1294.634	N_2O, CH_4, H_2O
70	1294.918	
71	1295.186	N_2O, CH_4, H_2O
72	1295.645	
73	1295.812	CH_4
74	1296.135	N_2O, CH_4, H_2O
75	1298.216	
76	1298.55	N_2O, CH_4
77	1298.903	N_2O
78	1299.211	H_2O, CH_4
79	1299.379	N_2O, CH_4
80	1300.504	

FRAME 47 (1925-1950 cm^{-1})

Seq. No.	ν(observed) (cm^{-1})	Identification
1	1925.065	H_2C
2	1925.351	?
3	1925.515	solar CO
4	1925.706	solar CO
5	1925.911	solar CO
6	1926.019	?
7	1926.255	CO_2
8	1926.511	solar CO, H_2O
9	1926.726	H_2O
10	1927.034	solar CO
11	1927.254	solar CO
12	1927.349	solar CO
13	1927.467	H_2O
14	1927.823	H_2O, CO_2, solar CO
15	1928.058	solar CO
16	1928.328	?
17	1928.440	solar CO
18	1928.625	solar CO
19	1929.107	solar CO +?
20	1929.356	CO_2
21	1929.585	solar CO, H_2O
22	1929.696	solar CO+?
23	1929.790	solar CO
24	1930.022	solar CO
25	1930.376	?
26	1930.473	solar CO
27	1930.695	H_2O
28	1930.907	CO_2
29	1931.168	solar CO
30	1931.301	solar CO
31	1931.407	solar CO
32	1931.506	?
33	1931.594	H_2O?
34	1931.695	solar CO
35	1932.111	H_2O
36	1932.388	H_2O
37	1932.544	CO_2, solar CO
38	1932.704	CO_2, solar CO?
39	1932.814	CO_2, H_2O
40	1933.487	
41	1933.640	CO_2
42	1933.814	CO_2
43	1933.996	CO_2
44	1934.185	CO_2
45	1934.278	solar CO
46	1934.391	CO_2
47	1934.602	CO_2
48	1934.819	CO_2
49	1935.024	CO_2, solar CO
50	1935.320	H_2O*, CO_2
51	1935.486	solar CO
52	1935.554	CO_2, solar CO
53	1935.679	H_2O
54	1935.814	CO_2, H_2O
55	1936.000	solar CO
56	1936.089	CO_2, solar CO
57	1936.226	H_2O
58	1936.387	CO_2
59	1936.665	H_2O, CO_2, solar CO
60	1937.009	H_2O

FRAME 47 (1925-1950 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
61	1937.221	H_2O
62	1937.450	H_2O
63	1937.642	solar CO
64	1937.819	solar CO
65	1937.947	H_2O, CO_2
66	1938.163	H_2O
67	1938.473	solar CO, H_2O
68	1938.679	H_2O, solar CO
69	1938.883	solar CO
70	1939.130	H_2O
71	1939.401	solar CO
72	1939.522	CO_2, solar CO
73	1939.958	solar CO+?
74	1940.261	H_2O, solar CO
75	1940.420	solar CO
76	1940.719	solar CO?
77	1940.845	solar CO?
78	1941.206	} H_2O
79	1943.686	
80	1944.973	} H_2O
81	1946.851	
82	1947.348	solar CO
83	1947.498	solar CO, CO_2
84	1947.612	solar CO
85	1947.811	solar CO
86	1947.928	?
87	1948.196	solar CO
88	1948.261	solar CO
89	1948.420	solar CO
90	1948.529	solar CO
91	1948.630	?
92	1948.737	solar CO
93	1948.907	solar CO
94	1949.235	H_2O
95	1949.435	H_2O
96	1949.580	solar CO
97	1949.801	H_2O

FRAME 48 (1950-1975 cm^{-1})

Seq. No.	ν(observed) (cm^{-1})	Identification
1	1950.109	H_2O
2	1950.214	H_2O*
3	1950.333	H_2O*?
4	1950.444	solar CO?
5	1950.686	CO_2, solar CO
6	1950.820	solar CO
7	1951.125	H_2O
8	1951.448	solar CO
9	1951.764	solar CO
10	1952.093	solar CO, H_2O
11	1952.181	H_2O
12	1952.311	CO_2, solar CO
13	1952.471	?
14	1952.710	?
15	1952.824	solar CO
16	1952.907	solar CO
17	1953.015	solar CO
18	1953.146	solar CO
19	1953.310	H_2O
20	1953.449	solar CO
21	1953.619	solar CO
22	1953.745	solar CO
23	1953.826	solar CO
24	1953.924	CO_2, solar CO
25	1954.029	solar CO
26	1954.421	H_2O
27	1954.726	} H_2O
28	1955.268	
29	1955.521	CO_2
30	1955.729	H_2O
31	1955.846	solar CO, H_2O
32	1956.22	H_2O
33	1956.551	H_2O*
34	1956.622	H_2O
35	1956.808	H_2O
36	1957.028	H_2O, solar CO
37	1957.154	CO_2, solar CO
38	1957.352	solar CO
39	1957.649	H_2O, solar CO
40	1958.082	solar CO, H_2O
41	1958.284	solar CO
42	1958.603	solar CO, H_2O
43	1958.723	solar CO
44	1958.769	CO_2
45	1958.978	solar CO+?
46	1959.089	solar CO
47	1959.242	solar CO
48	1959.401	solar CO, N_2O
49	1959.633	H_2O
50	1959.796	solar CO
51	1959.909	?
52	1960.131	solar CO
53	1960.412	CO_2, solar CO
54	1960.712	H_2O
55	1960.933	} H_2O
56	1961.373	
57	1961.923	H_2O
58	1962.021	CO_2, solar CO
59	1962.113	solar CO
60	1962.203	N_2O

FRAME 48 (1950-1975 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
61	1962.302	solar CO
62	1962.440	?
63	1962.559	solar CO
64	1962.663	?
65	1962.932	solar CO
66	1963.086	solar CO, N_2O
67	1963.285	solar CO
68	1963.424	?
69	1963.555	?
70	1963.660	CO_2, solar CO
71	1963.723	solar CO
72	1963.862	solar CO
73	1963.970	?
74	1964.065	solar CO, N_2O
75	1964.183	H_2O
76	1964.269	solar CO
77	1964.462	?
78	1964.582	solar CO +?
79	1964.674	?
80	1964.774	solar CO
81	1964.953	solar CO
82	1965.291	CO_2, solar CO, H_2O
83	1965.870	} H_2O
84	1968.195	
85	1968.561	CO_2, solar CO
86	1968.690	solar CO +?
87	1968.816	solar CO
88	1968.923	?
89	1969.263	H_2O, solar CO
90	1969.367	H_2O, solar CO
91	1969.447	solar CO, H_2O
92	1969.558	H_2O, solar CO
93	1969.651	solar CO
94	1969.765	H_2O
95	1969.930	solar CO, H_2O
96	1970.130	solar CO
97	1970.218	CO_2, H_2O, solar CO
98	1970.525	solar CO
99	1970.663	solar CO
100	1971.110	solar CO
101	1971.290	solar CO, N_2O
102	1971.447	solar CO
103	1971.846	CO_2
104	1971.906	solar CO
105	1971.981	solar CO
106	1972.162	solar CO
107	1972.265	solar CO +?
108	1972.590	H_2O, solar CO
109	1972.778	N_2O?
110	1972.984	H_2O, N_2O
111	1973.172	solar CO
112	1973.292	solar CO
113	1973.382	solar CO
114	1973.457	solar CO, CO_2
115	1973.635	N_2O
116	1973.905	solar CO
117	1974.028	solar CO, N_2O
118	1974.216	solar CO
119	1974.378	solar CO, N_2O
120	1974.490	N_2O

FRAME 48 (1950-1975 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
121	1974.603	solar CO, H_2O*
122	1974.753	solar CO?
123	1974.874	solar CO
124	1974.977	solar CO?

FRAME 49 (1975-2000 cm^{-1})

Seq. No.	ν(observed) (cm^{-1})	Identification
1	1975.134	CO_2
2	1975.248	solar CO?
3	1975.347	H_2O
4	1975.454	H_2O, solar CO
5	1975.650	solar CO
6	1976.18	H_2O
7	1976.639	solar CO
8	1976.760	CO_2, CO, solar CO
9	1976.817	H_2O
10	1977.014	solar CO
11	1977.274	solar CO
12	1977.626	H_2O
13	1978.015	H_2O
14	1978.119	solar CO
15	1978.316	solar CO, CO_2
16	1978.476	?
17	1978.585	solar CO
18	1978.703	solar CO
19	1978.822	?
20	1978.929	solar CO
21	1979.085	H_2O
22	1979.198	solar CO
23	1979.542	solar CO
24	1979.721	solar CO
25	1979.786	solar CO
26	1980.085	CO_2
27	1980.215	solar CO
28	1980.755	H_2O
29	1981.021	H_2O
30	1981.334	H_2O*, solar CO
31	1981.607	H_2O
32	1981.742	CO_2
33	1981.785	solar CO
34	1981.987	H_2O
35	1982.187	H_2O*
36	1982.425	O_3
37	1982.570	solar CO
38	1982.686	H_2O
39	1982.763	solar CO, H_2O
40	1983.031	H_2O
41	1983.119	solar CO
42	1983.279	solar CO
43	1983.393	H_2O, CO_2
44	1983.567	solar CO
45	1983.939	solar CO
46	1984.064	N_2O
47	1984.166	solar CO, H_2O
48	1984.300	H_2O
49	1984.513	H_2O
50	1984.789	N_2O
51	1985.020	?
52	1985.132	solar CO
53	1985.261	CO_2?
54	1985.560	solar CO
55	1985.777	solar CO, O_3
56	1985.887	solar CO
57	1985.994	H_2O
58	1986.458	H_2O
59	1986.543	solar CO
60	1986.657	H_2O

FRAME 49 (1975-2000 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
61	1986.906	solar CO, H_2O
62	1987.168	H_2O, solar CO
63	1987.338	H_2O
64	1987.942	H_2O
65	1988.816	
66	1989.210	solar CO
67	1989.517	solar CO +?
68	1989.941	H_2O
69	1990.170	solar CO, H_2O
70	1990.262	solar CO, CO
71	1990.458	solar CO
72	1991.161	H_2O
73	1993.356	
74	1993.848	solar CO
75	1994.031	solar CO
76	1994.186	solar CO
77	1994.286	solar CO
78	1994.522	CO_2, O_3
79	1994.691	solar CO
80	1994.855	?
81	1994.994	solar CO
82	1995.105	solar CO
83	1995.243	H_2O, solar CO
84	1995.374	O_3 ?
85	1995.560	H_2O, CO, solar CO
86	1995.808	solar CO
87	1995.961	H_2O
88	1996.097	solar CO, CO_2
89	1996.277	solar CO
90	1996.450	solar CO
91	1996.526	H_2O
92	1996.630	solar CO, H_2O
93	1996.822	? $+O_3$
94	1996.893	solar CO
95	1997.026	solar CO
96	1997.131	solar CO
97	1997.242	solar CO
98	1997.415	solar CO
99	1997.722	CO_2
100	1997.997	O_3?
101	1998.698	H_2O
102	1999.163	
103	1999.490	solar CO, H_2O
104	1999.598	solar CO
105	1999.784	solar CO
106	1999.945	H_2O

FRAME 50 (2000-2025 cm^{-1})

Seq. No.	ν(observed) (cm^{-1})	Identification
1	2000.076	solar CO
2	2000.195	O_3?
3	2000.289	solar CO
4	2000.433	solar CO
5	2000.502	solar CO
6	2000.898	H_2O, CO_2
7	2001.008	H_2O*
8	2001.159	solar CO
9	2001.413	solar CO
10	2001.643	O_3
11	2001.805	H_2O
12	2001.896	O_3?
13	2002.114	solar CO
14	2002.222	solar CO
15	2002.471	CO_2
16	2002.683	solar CO, H_2O
17	2002.799	solar CO
18	2002.931	solar CO
19	2003.014	H_2O
20	2003.055	solar CO
21	2003.165	solar CO
22	2003.394	H_2O
23	2003.455	solar CO, CO
24	2003.666	solar CO, H_2O, CO
25	2003.776	O_3
26	2003.977	solar CO
27	2004.057	CO_2
28	2004.175	H_2O, solar CO
29	2004.336	solar CO, CO
30	2004.470	solar CO
31	2004.668	O_3
32	2004.822	O_3
33	2004.925	H_2O, solar CO, O_3
34	2005.224	O_3
35	2005.422	solar CO
36	2005.629	H_2O, CO_2
37	2005.871	O_3, H_2O
38	2006.014	solar CO
39	2006.486	solar CO
40	2006.629	O_3
41	2006.784	solar CO
42	2006.958	H_2O
43	2007.162	solar CO
44	2007.219	CO_2
45	2007.68	H_2O
46	2008.065	H_2O, solar CO
47	2008.420	solar CO
48	2008.533	solar CO
49	2008.798	CO_2
50	2009.32	H_2O
51	2009.864	solar CO, O_3
52	2009.971	?
53	2010.108	solar CO
54	2010.264	solar CO, O_3
55	2010.375	CO_2
56	2010.688	O_3
57	2010.762	solar CO
58	2010.901	H_2O
59	2011.018	O_3
60	2011.082	solar CO

FRAME 50 (2000-2025 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
61	2011.314	H_2O
62	2011.418	solar CO
63	2011.579	?
64	2011.730	solar CO, O_3
65	2011.847	H_2O, solar CO
66	2011.960	CO_2
67	2012.106	solar CO
68	2012.191	solar CO, H_2O, CO
69	2012.242	solar CO, O_3
70	2012.411	H_2O, O_3
71	2012.546	O_3
72	2012.741	solar CO, H_2O
73	2012.828	solar CO, CO
74	2012.924	H_2O
75	2013.006	O_3
76	2013.216	solar CO
77	2013.351	solar CO
78	2013.537	CO_2
79	2013.921	O_3+?
80	2013.998	O_3
81	2014.340	solar CO
82	2014.438	H_2O
83	2014.576	solar CO
84	2014.672	H_2O
85	2014.829	H_2O
86	2015.003	solar CO, O_3
87	2015.101	CO_2, solar CO
88	2015.296	H_2O
89	2015.439	O_3
90	2015.726	H_2O
91	2015.930	solar CO
92	2016.038	solar CO
93	2016.408	H_2O, CO_2
94	2017.282	
95	2018.125	H_2O, CO_2
96	2018.567	
97	2018.839	H_2O, CO_2
98	2019.179	
99	2019.719	solar CO, O_3
100	2019.827	CO_2, solar CO
101	2019.933	H_2O
102	2020.158	CO_2, O_3
103	2020.409	solar CO
104	2020.545	H_2O, solar CO
105	2020.744	solar CO, O_3, CO
106	2020.932	solar CO
107	2020.989	solar CO
108	2021.101	O_3
109	2021.229	O_3
110	2021.418	CO_2
111	2021.560	solar CO
112	2021.860	O_3
113	2022.034	CO_2, solar CO, O_3
114	2022.123	O_3, H_2O
115	2022.344	solar CO
116	2023.03	H_2O, CO_2
117	2023.395	solar CO
118	2023.811	solar CO, O_3
119	2023.913	O_3, CO_2
120	2024.124	?

FRAME 50 (2000-2025 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
121	2024.225	solar CO, O_3
122	2024.386	H_2O
123	2024.564	CO_2
124	2024.825	CO_2, O_3
125	2024.910	solar CO
126	2024.999	CO, CO_2, O_3

FRAME 51 (2025-2050 cm^{-1})

Seq. No.	ν(observed) (cm^{-1})	Identification
1	2025.093	solar CO
2	2025.145	solar CO
3	2025.254	H_2O
4	2025.317	O_3
5	2025.527	CO
6	2025.643	O_3, H_2O
7	2025.800	solar CO
8	2025.881	H_2O
9	2025.965	H_2O, O_3
10	2026.130	CO_2
11	2026.265	solar CO?
12	2026.62	H_2O
13	2027.03	H_2O
14	2027.416	OCS, O_3
15	2027.683	CO_2, solar CO, CO
16	2027.920	CO_2, solar CO
17	2028.039	H_2O
18	2028.183	solar CO
19	2028.344	H_2O +?
20	2028.527	OCS?
21	2028.646	O_3
22	2028.751	solar CO, O_3
23	2028.884	solar CO, O_3
24	2029.024	OCS
25	2029.127	solar CO, CO_2
26	2029.262	CO_2, CO, solar CO
27	2029.375	solar CO
28	2029.434	CO_2, solar CO
29	2029.536	solar CO
30	2029.655	solar CO, CO
31	2029.795	O_3?
32	2029.993	H_2O
33	2030.163	solar CO
34	2030.249	H_2O
35	2030.310	solar CO
36	2030.505	solar CO, CO_2
37	2030.645	O_3
38	2030.844	CO_2
39	2030.930	CO_2
40	2031.119	O_3, OCS
41	2031.213	?
42	2031.383	solar CO
43	2031.475	O_3
44	2031.608	solar CO, O_3
45	2031.705	O_3
46	2031.776	CO_2
47	2031.929	CO_2+?
48	2032.203	solar CO, H_2O
49	2032.398	CO_2, CO, solar CO
50	2032.562	solar CO
51	2032.667	OCS?, O_3
52	2032.821	solar CO
53	2033.061	solar CO, OCS?
54	2033.143	solar CO
55	2033.254	solar CO
56	2033.371	CO, CO_2, solar CO
57	2033.510	O_3, solar CO
58	2033.699	solar CO, O_3
59	2033.916	CO_2, CO
60	2034.046	H_2O

FRAME 51 (2025-2050 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
61	2034.401	solar CO, H_2O
62	2034.495	solar CO
63	2034.568	O_3
64	2034.714	solar CO, OCS
65	2034.795	OCS, solar CO
66	2034.923	solar CO
67	2035.071	solar CO
68	2035.148	H_2O
69	2035.228	OCS, O_3
70	2035.311	H_2O
71	2035.405	CO_2
72	2035.510	H_2O
73	2035.639	solar CO+?
74	2035.766	OCS, O_3
75	2036.000	O_3 +?
76	2036.129	solar CO
77	2036.247	solar CO, OCS
78	2036.329	solar CO
79	2036.601	?
80	2036.807	H_2O, solar CO
81	2036.911	CO_2
82	2037.025	solar CO, CO
83	2037.135	CO_2, solar CO
84	2037.279	solar CO
85	2037.51	H_2O, CO_2, CO, solar CO
86	2037.828	CO_2, solar CO +?
87	2037.903	CO, OCS
88	2038.021	CO_2
89	2038.102	H_2O
90	2038.244	OCS, solar CO
91	2038.413	CO_2
92	2038.590	solar CO, CO_2
93	2038.718	solar CO, OCS?
94	2038.928	OCS, O_3
95	2039.041	O_3
96	2039.111	CO_2
97	2039.271	H_2O, OCS
98	2039.373	solar CO
99	2039.450	CO_2, solar CO, OCS
100	2039.[illegible]	solar CO
101	2039.[illegible]	CO_2, H_2O
102	2040.119	O_3 +?
103	2040.251	solar CO, OCS
104	2040.434	O_3 +?
105	2040.584	OCS +?
106	2041.016	H_2O, CO_2, CO
107	2041.618	
108	2042.006	CO, OCS
109	2042.287	solar CO
110	2042.366	?
111	2042.560	OCS, CO_2
112	2042.826	solar CO
113	2042.955	CO_2, solar CO
114	2043.110	solar CO, O_3
115	2043.789	H_2O
116	2044.100	
117	2044.466	CO_2
118	2044.713	solar CO
119	2044.987	solar CO, O_3
120	2045.064	OCS, solar CO

FRAME 51 (2025-2050 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
121	2045.218	O_3
122	2045.310	?
123	2045.421	OCS, solar CO
124	2045.583	OCS
125	2045.677	CO_2
126	2045.734	CO, solar CO
127	2045.988	CO_2
128	2046.286	CO, solar CO
129	2046.52	H_2O
130	2046.769	H_2O*
131	2046.961	solar CO
132	2047.055	OCS + ?
133	2047.148	O_3
134	2047.224	OCS
135	2047.391	solar CO
136	2047.511	CO_2
137	2047.639	solar CO
138	2047.742	solar CO, H_2O
139	2047.829	O_3
140	2047.950	solar CO
141	2048.021	OCS + ?
142	2048.118	OCS
143	2048.293	O_3+?
144	2048.495	OCS + ?
145	2048.655	H_2O, solar CO
146	2048.774	solar CO
147	2048.873	solar CO
148	2049.036	CO_2, OCS
149	2049.347	CO_2
150	2049.447	OCS, CO_2
151	2049.576	solar CO, CO_2
152	2049.710	CO_2, H_2O, solar CO
153	2049.842	CO, solar CO, CO_2, OCS
154	2049.926	OCS, CO_2, solar CO

FRAME 52 (2050-2075 cm^{-1})

Seq. No.	ν(observed) (cm^{-1})	Identification
1	2050.066	CO; O_3
2	2050.303	O_3
3	2050.424	OCS, solar CO
4	2050.564	CO_2, solar CO
5	2050.854	CO, OCS, solar CO
6	2050.965	O_3
7	2051.072	solar CO, H_2O
8	2051.337	OCS, H_2O
9	2051.577	H_2O, OCS
10	2051.629	solar CO, O_3
11	2051.740	solar CO
12	2051.788	OCS
13	2052.095	CO_2
14	2052.330	O_3
15	2052.416	O_3, CO
16	2052.515	O_3
17	2052.609	?
18	2052.709	OCS, solar CO
19	2052.818	solar CO
20	2052.866	solar CO
21	2052.989	H_2O
22	2053.183	OCS, solar CO
23	2053.445	solar CO
24	2053.628	CO_2
25	2053.856	CO, H_2O
26	2054.066	OCS, CO
27	2054.194	solar CO
28	2054.291	O_3, solar CO +?
29	2054.424	H_2O
30	2054.513	OCS, H_2O
31	2054.786	O_3, H_2O
32	2054.988	OCS
33	2055.155	CO_2
34	2055.396	CO, OCS, solar CO
35	2055.750	solar CO
36	2055.858	OCS + ?
37	2056.040	solar CO
38	2056.171	solar CO
39	2056.292	OCS, solar CO
40	2056.526	solar CO
41	2056.690	CO_2
42	2057.168	OCS, solar CO
43	2057.271	O_3, OCS
44	2057.374	OCS, O_3
45	2057.483	solar CO
46	2057.610	OCS, solar CO
47	2057.740	solar CO, O_3
48	2057.870	CO, solar CO
49	2058.230	CO_2, CO, OCS
50	2058.477	OCS, solar CO
51	2058.575	CO_2, O_3, H_2O +?
52	2058.715	?
53	2058.808	O_3
54	2058.900	OCS, solar CO
55	2059.080	solar CO, H_2O
56	2059.210	solar CO, OCS
57	2059.328	OCS, O_3
58	2059.763	CO_2
59	2059.908	CO, solar CO
60	2060.154	OCS

FRAME 52 (2050-2075 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
61	2060.322	H_2O
62	2060.633	H_2O
63	2061.038	OCS, CO_2
64	2061.317	CO_2
65	2061.665	O_3, solar CO
66	2061.819	CO, OCS, solar CO
67	2061.912	CO, O_3, H_2O
68	2061.995	O_3
69	2062.147	OCS + ?
70	2062.268	solar CO +?
71	2062.416	O_3+?
72	2062.583	OCS, CO_2, H_2O
73	2062.703	solar CO
74	2062.862	CO_2, OCS
75	2063.095	H_2O
76	2063.222	solar CO
77	2063.402	OCS, solar CO
78	2063.471	O_3
79	2063.581	O_3, OCS
80	2063.697	solar CO
81	2063.827	OCS, O_3, solar CO
82	2063.974	solar CO
83	2064.087	CO_2, O_3
84	2064.329	H_2O, CO_2, CO, OCS
85	2065.091	H_2O, CO_2, CO, OCS
86	2065.388	OCS, solar CO
87	2065.655	H_2O, CO_2, CO
88	2066.074	H_2O, CO_2, CO
89	2066.280	OCS, O_3
90	2066.489	OCS
91	2066.606	O_3, H_2O, OCS
92	2066.720	solar CO +?
93	2066.831	O_3
94	2066.879	OCS, O_3
95	2067.096	CO_2, solar CO
96	2067.238	OCS, solar CO, O_3
97	2067.283	H_2O, O_3
98	2067.512	CO_2
99	2067.755	H_2O, solar CO
100	2067.871	O_3, OCS
101	2067.976	OCS, O_3
102	2068.142	OCS, O_3
103	2068.251	OCS, O_3
104	2068.372	OCS, O_3
105	2068.473	solar CO, O_3
106	2068.530	CO_2, OCS
107	2068.621	CO_2, O_3, solar CO
108	2068.730	OCS, O_3
109	2068.845	CO, solar CO
110	2069.068	CO_2
111	2069.354	O_3
112	2069.430	OCS, O_3
113	2069.507	solar CO, O_3
114	2069.602	O_3
115	2069.660	CO
116	2069.796	OCS, O_3
117	2069.850	solar CO
118	2069.980	CO_2, O_3
119	2070.078	solar CO, O_3
120	2070.150	CO_2, OCS

FRAME 52 (2050-2075 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
121	2070.258	O_3
122	2070.354	O_3, OCS +?
123	2070.439	OCS, O_3
124	2070.624	CO_2
125	2070.778	O_3
126	2070.865	OCS, O_3
127	2071.037	solar CO, O_3
128	2071.139	solar CO, O_3 +?
129	2071.195	OCS, O_3
130	2071.319	O_3
131	2071.439	CO_2, solar CO
132	2071.539	OCS
133	2071.674	CO_2, O_3
134	2071.812	O_3
135	2071.911	OCS, O_3, H_2O
136	2072.044	O_3
137	2072.176	CO_2, OCS
138	2072.445	O_3, H_2O, solar CO +?
139	2072.544	H_2O, OCS
140	2072.881	CO_2, OCS, solar CO
141	2072.995	O_3, solar CO
142	2073.111	solar CO
143	2073.260	CO, CO_2, OCS, H_2O, solar CO
144	2073.469	CO, O_3, solar CO
145	2073.544	OCS, CO, O_3
146	2073.735	CO_2
147	2073.962	H_2O
148	2074.23	H_2O, CO_2, OCS
149	2074.484	OCS, solar CO, O_3
150	2074.695	O_3
151	2074.730	CO_2, O_3
152	2074.835	OCS, O_3
153	2074.900	O_3

FRAME 53 (2075-2100 cm^{-1})

Seq. No.	ν(observed) (cm^{-1})	Identification
1	2075.034	solar CO, O_3
2	2075.156	OCS, solar CO, O_3
3	2075.292	CO_2, O_3
4	2075.485	OCS, O_3, solar CO
5	2075.603	O_3
6	2075.730	O_3
7	2075.850	CO_2, O_3, OCS, H_2O
8	2075.961	O_3, H_2O
9	2076.101	OCS, O_3
10	2076.163	solar CO
11	2076.279	CO_2, O_3
12	2076.433	OCS
13	2076.528	O_3
14	2076.865	} CO_2,CO,O_3,H_2O,solar CO
15	2077.771	
16	2077.902	CO_2
17	2078.044	CO_2, H_2O
18	2078.196	CO_2
19	2078.365	CO_2
20	2078.55	H_2O, CO_2
21	2078.703	CO_2
22	2078.809	CO_2, O_3, H_2O
23	2078.914	CO_2
24	2079.027	O_3
25	2079.121	CO_2
26	2079.201	CO_2
27	2079.314	CO_2, O_3
28	2079.441	O_3, solar CO
29	2079.548	CO_2
30	2079.642	O_3, OCS
31	2079.786	CO_2, O_3
32	2079.930	H_2O
33	2080.021	O_3, solar CO, CO_2
34	2080.127	O_3, CO_2
35	2080.298	CO_2, O_3, solar CO
36	2080.440	OSC, O_3
37	2080.599	CO_2, O_3
38	2080.684	O_3
39	2080.766	CO_2
40	2080.882	CO_2, O_3
41	2080.993	O_3, OCS
42	2081.079	O_3, CO
43	2081.196	CO, O_3, CO_2
44	2081.258	solar CO, O_3, OCS
45	2081.364	O_3, CO, H_2O
46	2081.435	O_3, CO_2
47	2081.499	O_3, OCS
48	2081.604	CO_2?
49	2081.724	O_3
50	2081.88	H_2O, CO_2
51	2081.990	CO
52	2082.251	O_3
53	2082.332	CO_2
54	2082.450	CO_2, O_3
55	2082.587	O_3
56	2082.693	solar CO, O_3
57	2082.799	solar CO, O_3
58	2082.919	solar CO, H_2O
59	2083.034	O_3
60	2083.132	O_3

FRAME 53 (2075-2100 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
61	2083.178	solar CO
62	2083.332	CO_2, O_3
63	2083.446	O_3
64	2083.587	O_3
65	2083.664	O_3
66	2083.773	H_2O
67	2083.897	CO_2
68	2083.999	CO_2, O_3
69	2084.090	O_3
70	2084.207	O_3
71	2084.324	O_3, solar CO
72	2084.427	O_3
73	2084.483	O_3, OCS
74	2084.623	O_3
75	2084.683	O_3
76	2084.757	solar CO, CO
77	2084.848	CO_2, O_3
78	2084.993	O_3, CO, H_2O
79	2085.085	O_3
80	2085.174	solar CO, H_2O?
81	2085.354	O_3, solar CO, CO
82	2085.463	CO_2, O_3, H_2O
83	2085.619	O_3
84	2085.727	solar CO
85	2085.764	O_3
86	2085.861	O_3, solar CO
87	2086.028	O_3, solar CO
88	2086.142	O_3
89	2086.323	CO, CO_2, solar CO
90	2086.424	O_3
91	2086.581	solar CO, O_3
92	2086.686	O_3
93	2086.761	O_3
94	2086.832	O_3, solar CO, H_2O
95	2086.926	O_3
96	2087.037	CO_2, O_3
97	2087.170	O_3
98	2087.39	H_2O, O_3
99	2087.592	O_3
100	2087.735	O_3
101	2087.842	O_3
102	2087.921	CO_2, O_3
103	2088.041	O_3
104	2088.196	O_3
105	2088.338	O_3, solar CO
106	2088.401	O_3
107	2088.561	O_3
108	2088.608	CO_2
109	2088.702	O_3, CO, H_2O
110	2088.792	solar CO
111	2088.888	O_3
112	2088.987	O_3, solar CO
113	2089.042	solar CO, O_3
114	2089.168	O_3
115	2089.224	solar CO, H_2O
116	2089.372	O_3, solar CO
117	2089.422	O_3, CO_2
118	2089.509	solar CO, O_3
119	2089.685	H_2O, CO_2, O_3
120	2090.219	

FRAME 53 (2075-2100 cm^{-1}) Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
121	2090.484	O_3
122	2090.605	CO, O_3
123	2090.709	O_3
124	2090.832	O_3
125	2090.957	O_3, H_2O
126	2091.046	H_2O, O_3
127	2091.113	O_3
128	2091.225	O_3
129	2091.352	O_3
130	2091.449	O_3
131	2091.500	solar CO
132	2091.617	O_3
133	2091.754	CO_2, H_2O
134	2091.887	O_3
135	2092.057	O_3
136	2092.165	solar CO
137	2092.230	O_3
138	2092.337	O_3, H_2O, CO_2
139	2092.420	O_3, CO
140	2092.546	H_2O, solar CO
141	2092.716	O_3, solar CO
142	2092.764	O_3
143	2092.857	O_3
144	2092.964	O_3, H_2O
145	2093.084	O_3, CO_2
146	2093.160	O_3
147	2093.401	CO_2, H_2O, O_3
148	2093.491	CO_2, H_2O
149	2093.590	CO_2, O_3
150	2093.778	O_3, CO_2, H_2O
151	2093.944	CO_2, O_3, H_2O
152	2094.044	CO_2, O_3
153	2094.093	O_3, CO_2, H_2O
154	2094.254	solar CO, CO_2
155	2094.395	O_3, CO_2
156	2094.503	O_3, CO_2
157	2094.636	CO_2
158	2094.868	CO,O_3,CO_2,H_2O,solar CO
159	2094.997	H_2O, O_3
160	2095.088	O_3, CO_2, H_2O
161	2095.148	O_3
162	2095.204	O_3, H_2O
163	2095.292	O_3, solar CO
164	2095.411	O_3
165	2095.552	O_3, H_2O
166	2095.698	CO_2
167	2095.865	O_3, H_2O
168	2095.938	O_3
169	2096.107	O_3, solar CO
170	2096.239	O_3, H_2O
171	2096.507	O_3, CO_2
172	2096.587	O_3
173	2096.687	O_3
174	2096.813	O_3
175	2096.970	O_3, H_2O
176	2097.151	O_3
177	2097.274	O_3, CO_2
178	2097.366	H_2O, O_3
179	2097.605	O_3
180	2097.705	O_3, CO_2?

FRAME 53 (2075-2100 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
181	2097.818	solar CO, O_3
182	2097.894	O_3
183	2098.002	O_3
184	2098.149	O_3
185	2098.311	O_3, solar CO
186	2098.470	solar CO, O_3
187	2098.584	O_3, H_2O
188	2098.721	solar CO, O_3
189	2098.817	CO_2
190	2098.920	O_3
191	2099.013	O_3
192	2099.084	CO
193	2099.319	O_3, CO_2
194	2099.453	O_3, solar CO
195	2099.564	O_3, solar CO
196	2099.635	O_3, CO_2, CO
197	2099.874	O_3

FRAME 54 (2100-2125 cm^{-1})

Seq. No.	ν(observed) (cm^{-1})	Identification
1	2100.023	O_3
2	2100.140	O_3
3	2100.346	O_3
4	2100.429	H_2O, CO_2
5	2100.573	O_3
6	2100.710	O_3
7	2100.815	solar CO, CO_2, O_3
8	2100.975	O_3
9	2101.103	O_3, CO
10	2101.235	CO_2
11	2101.317	O_3, solar CO
12	2101.480	O_3, solar CO
13	2101.591	O_3
14	2101.806	O_3, H_2O
15	2101.894	O_3
16	2101.987	O_3, CO_2
17	2102.053	O_3, solar CO
18	2102.178	solar CO, O_3
19	2102.291	O_3
20	2102.448	CO_2, O_3
21	2102.535	O_3
22	2102.628	solar CO, O_3
23	2102.745	O_3
24	2102.864	O_3, CO_2, solar CO
25	2102.961	O_3, CO, H_2O
26	2103.268	CO, O_3, H_2O, solar CO
27	2103.441	O_3
28	2103.592	O_3, CO_2
29	2103.703	O_3
30	2103.797	O_3
31	2103.893	O_3
32	2103.983	CO_2, O_3
33	2104.095	solar CO, O_3
34	2104.196	O_3
35	2104.284	solar CO, O_3
36	2104.420	O_3, CO_2
37	2104.562	O_3
38	2104.715	O_3, solar CO
39	2104.817	O_3, solar CO
40	2104.943	O_3, CO
41	2105.107	O_3, solar CO
42	2105.243	solar CO, O_3
43	2105.331	O_3
44	2105.542	O_3, CO_2
45	2105.743	H_2O, O_3
46	2105.986	CO_2, O_3
47	2106.036	O_3, solar CO
48	2106.184	O_3, solar CO, H_2O
49	2106.279	O_3
50	2106.347	H_2O, O_3
51	2106.494	O_3, CO
52	2106.666	O_3, solar CO
53	2106.747	O_3, H_2O
54	2106.917	CO, O_3
55	2107.055	O_3
56	2107.148	O_3, CO_2
57	2107.195	O_3, CO_2
58	2107.337	O_3
59	2107.427	CO, O_3
60	2107.538	H_2O, CO_2, O_3

FRAME 54 (2100-2125 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
61	2107.677	O_3
62	2107.845	O_3
63	2107.960	O_3
64	2108.074	O_3
65	2108.236	O_3
66	2108.364	O_3, solar CO
67	2108.543	O_3
68	2108.678	O_3, CO_2, solar CO
69	2108.752	O_3, CO, solar CO
70	2108.881	O_3
71	2109.016	O_3
72	2109.121	O_3, CO_2, solar CO
73	2109.256	O_3
74	2109.391	O_3
75	2109.435	O_3, solar CO
76	2109.555	O_3
77	2109.681	O_3
78	2109.748	O_3, solar CO
79	2109.864	O_3
80	2109.946	O_3, CO, H_2O
81	2110.083	O_3
82	2110.191	O_3, solar CO
83	2110.251	O_3, CO_2
84	2110.436	O_3, CO
85	2110.543	O_3, solar CO
86	2110.666	solar CO
87	2110.767	CO_2, O_3
88	2110.957	O_3
89	2111.048	solar CO
90	2111.176	O_3
91	2111.296	O_3
92	2111.543	CO, H_2O, O_3
93	2111.774	CO_2, O_3
94	2111.949	O_3
95	2112.040	?
96	2112.149	solar CO
97	2112.326	CO_2, O_3, solar CO
98	2112.411	solar CO
99	2112.558	solar CO, CO
100	2112.650	solar CO, O_3
101	2112.808	O_3
102	2112.896	solar CO
103	2113.024	O_3, solar CO
104	2113.125	O_3
105	2113.236	O_3
106	2113.346	CO_2, CO, O_3
107	2113.496	solar CO
108	2113.594	O_3
109	2113.830	O_3, H_2O
110	2113.954	CO_2, CO, H_2O
111	2114.058	O_3
112	2114.269	O_3, H_2O
113	2114.403	H_2O, O_3
114	2114.597	O_3, H_2O
115	2114.773	O_3
116	2115.00	H_2O, CO_2, O_3
117	2115.318	O_3
118	2115.397	O_3
119	2115.627	CO, O_3, CO_2
120	2115.858	O_3, solar CO

FRAME 54 (2100-2125 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
121	2116.034	solar CO, H_2O, O_3
122	2116.108	O_3
123	2116.230	O_3, H_2O
124	2116.405	O_3
125	2116.471	CO_2
126	2116.589	O_3
127	2116.693	O_3
128	2116.791	O_3, CO
129	2116.907	solar CO, O_3
130	2116.957	O_3
131	2117.150	CO_2, O_3
132	2117.289	O_3
133	2117.442	CO, O_3
134	2117.481	O_3
135	2117.586	O_3
136	2117.679	O_3
137	2117.791	solar CO, O_3
138	2117.879	O_3
139	2118.003	O_3, CO_2
140	2118.168	O_3
141	2118.261	O_3, solar CO
142	2118.356	O_3
143	2118.448	O_3, H_2O
144	2118.652	O_3, CO_2, solar CO
145	2118.814	O_3
146	2118.898	O_3
147	2119.012	O_3, solar CO
148	2119.136	O_3
149	2119.285	O_3, H_2O, solar CO
150	2119.345	O_3
151	2119.521	O_3
152	2119.684	CO, CO_2, O_3
153	2119.812	O_3
154	2119.929	O_3
155	2120.032	O_3
156	2120.102	O_3
157	2120.247	O_3, CO
158	2120.345	O_3, CO_2
159	2120.398	O_3
160	2120.460	O_3
161	2120.576	O_3, solar CO
162	2120.636	O_3
163	2120.708	O_3
164	2120.762	O_3
165	2120.864	CO, O_3
166	2120.954	O_3
167	2121.168	CO_2, O_3
168	2121.265	O_3, H_2O, solar CO
169	2121.459	O_3, solar CO
170	2121.582	O_3, H_2O
171	2121.743	O_3
172	2121.883	O_3
173	2121.947	O_3, CO_2
174	2122.028	O_3
175	2122.155	O_3, solar CO
176	2122.325	O_3
177	2122.463	O_3, H_2O
178	2122.520	O_3
179	2122.652	O_3
180	2122.734	O_3, CO_2, solar CO

FRAME 54 (2100-2125 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
181	2122.842	H_2O, O_3
182	2122.919	O_3
183	2123.048	O_3
184	2123.171	O_3, H_2O
185	2123.311	O_3
186	2123.480	O_3
187	2123.571	O_3, CO, CO_2
188	2123.700	CO, O_3
189	2123.872	O_3
190	2124.022	O_3
191	2124.113	O_3, solar CO
192	2124.187	O_3
193	2124.273	H_2O, O_3, CO, CO_2
194	2124.433	O_3
195	2124.582	O_3
196	2124.725	O_3
197	2124.887	H_2O, O_3

FRAME 55 (2125-2150 cm^{-1})

Seq. No.	ν(observed) (cm^{-1})	Identification
1	2125.104	O_3
2	2125.221	O_3, solar CO
3	2125.329	?
4	2125.436	O_3, H_2O
5	2125.584	O_3
6	2125.682	O_3, H_2O
7	2125.916	O_3, CO_2, solar CO
8	2125.991	O_3
9	2126.053	O_3
10	2126.170	O_3, solar CO, H_2O
11	2126.232	O_3
12	2126.414	O_3
13	2126.527	O_3
14	2126.664	O_3
15	2126.753	solar CO
16	2126.943	CO, O_3
17	2126.995	O_3
18	2127.128	O_3, H_2O
19	2127.266	O_3
20	2127.390	O_3, solar CO
21	2127.452	CO_2, O_3, solar CO
22	2127.563	O_3, solar CO
23	2127.678	CO, O_3, solar CO
24	2127.849	O_3
25	2128.015	O_3, solar CO, H_2O
26	2128.158	O_3
27	2128.284	solar CO, O_3, H_2O
28	2128.421	O_3
29	2128.472	O_3
30	2128.582	solar CO, O_3
31	2128.623	O_3
32	2128.716	O_3
33	2128.814	O_3, H_2O, solar CO
34	2128.897	O_3, N_2O, CO_2, H_2O
35	2128.961	CO_2, O_3
36	2129.095	O_3
37	2129.160	O_3, CO_2
38	2129.306	O_3, CO_2
39	2129.395	O_3, CO_2, solar CO
40	2129.545	O_3, CO_2, solar CO, H_2O
41	2129.660	CO_2, O_3
42	2129.733	CO_2, H_2O, O_3
43	2129.880	O_3, N_2O
44	2130.084	O_3, N_2O
45	2130.201	O_3, solar CO, CO, H_2O
46	2130.295	O_3, solar CO
47	2130.418	O_3
48	2130.540	O_3
49	2130.608	solar CO, O_3
50	2130.682	O_3
51	2130.794	O_3, solar CO
52	2130.933	CO, O_3
53	2131.006	CO, O_3, solar CO
54	2131.096	O_3, solar CO
55	2131.184	N_2O, O_3
56	2131.293	solar CO, O_3
57	2131.476	O_3
58	2131.630	CO, O_3, solar CO, H_2O
59	2131.850	O_3
60	2131.968	O_3, solar CO

FRAME 55 (2125-2150 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
61	2132.137	O_3
62	2132.252	O_3
63	2132.295	solar CO, O_3, N_2O
64	2132.365	O_3
65	2132.429	O_3
66	2132.485	O_3
67	2132.583	O_3
68	2132.702	O_3
69	2132.752	O_3
70	2132.809	solar CO, O_3
71	2132.903	solar CO, O_3, CO_2
72	2133.015	O_3, solar CO
73	2133.181	O_3
74	2133.362	O_3
75	2133.420	O_3
76	2133.523	CO, O_3, N_2O
77	2133.627	solar CO, O_3
78	2133.683	O_3?
79	2133.802	O_3
80	2133.948	O_3, solar CO
81	2134.049	?
82	2134.190	solar CO
83	2134.290	CO, solar CO, O_3
84	2134.465	CO_2, O_3
85	2134.523	solar CO, CO
86	2134.804	O_3
87	2134.908	?
88	2135.081	O_3
89	2135.181	O_3, solar CO
90	2135.316	solar CO
91	2135.435	solar CO
92	2135.544	CO, solar CO, H_2O
93	2136.13	H_2O, solar CO
94	2136.673	H_2O, CO, solar CO
95	2136.940	O_3
96	2137.048	solar CO
97	2137.205	H_2O, solar CO
98	2137.571	CO, solar CO, CO_2
99	2137.761	solar CO
100	2137.883	N_2O, O_3, H_2O
101	2137.997	solar CO
102	2138.185	H_2O, solar CO
103	2138.622	O_3
104	2138.904	solar CO
105	2139.023	N_2O, solar CO
106	2139.36	CO, H_2O, solar CO
107	2139.812	H_2O
108	2139.911	CO, solar CO, H_2O
109	2140.094	solar CO, N_2O
110	2140.170	solar CO
111	2140.263	O_3
112	2140.369	O_3
113	2140.532	solar CO
114	2140.686	CO_2, O_3
115	2140.827	CO, O_3, solar CO
116	2140.928	solar CO
117	2141.033	?
118	2141.184	N_2O, O_3, solar CO
119	2141.438	solar CO
120	2141.528	H_2O, CO, O_3

FRAME 55 (2125-2150 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
121	2141.726	O_3
122	2141.933	solar CO
123	2142.032	solar CO, H_2O
124	2142.132	$_3$, solar CO
125	2142.253	H_2O, N_2O
126	2142.368	solar CO, N_2O
127	2142.473	solar CO
128	2142.599	O_3?
129	2142.719	solar CO, H_2O
130	2142.820	solar CO
131	2142.952	solar CO
132	2143.055	solar CO, CO, O_3
133	2143.204	solar CO
134	2143.334	N_2O, O_3
135	2143.440	solar CO, O_3
136	2143.691	solar CO
137	2143.851	solar CO, H_2O
138	2143.970	solar CO, O_3
139	2144.033	CO, solar CO, O_3
140	2144.194	N_2O
141	2144.342	solar CO
142	2144.418	N_2O, solar CO
143	2144.524	solar CO
144	2144.808	H_2O
145	2144.955	O_3
146	2145.050	CO, N_2O
147	2145.170	N_2O, O_3
148	2145.461	H_2O, N_2O
149	2145.658	H_2O, solar CO
150	2145.762	solar CO
151	2145.914	solar CO
152	2146.005	solar CO
153	2146.141	N_2O
154	2146.200	solar CO, CO
155	2146.367	solar CO, O_3
156	2146.516	N_2O
157	2146.691	solar CO
158	2146.785	solar CO, O_3
159	2147.082	CO
160	2147.196	CO, solar CO
161	2147.396	H_2O, solar CO
162	2147.556	N_2O
163	2147.695	O_3, solar CO
164	2147.933	solar CO, O_3
165	2148.000	solar CO, N_2O
166	2148.076	solar CO
167	2148.190	H_2O
168	2148.348	H_2O*
169	2148.559	N_2O, solar CO
170	2148.726	N_2O, O_3
171	2148.839	solar CO
172	2149.008	N_2O, solar CO
173	2149.084	solar CO, H_2O
174	2149.236	CO, solar CO, O_3
175	2149.346	solar CO, O_3
176	2149.492	solar CO
177	2149.638	N_2O, solar CO
178	2149.771	solar CO, N_2O
179	2149.947	solar CO, N_2O

FRAME 56 (2150-2175 cm^{-1})

Seq. No.	ν(observed) (cm^{-1})	Identification
1	2150.185	O_3
2	2150.339	solar CO, CO
3	2150.530	solar CO
4	2150.645	N_2O
5	2150.735	solar CO
6	2150.854	CO
7	2151.180	H_2O, solar CO
8	2151.279	solar CO
9	2151.445	solar CO
10	2151.566	solar CO
11	2151.693	N_2O
12	2151.804	N_2O
13	2152.056	N_2O
14	2152.202	solar CO
15	2152.360	solar CO
16	2152.553	H_2O
17	2152.709	N_2O
18	2152.940	solar CO
19	2153.090	O_3, solar CO
20	2153.214	N_2O
21	2153.283	N_2O
22	2153.425	CO, N_2O+?
23	2153.501	solar CO
24	2153.608	solar CO
25	2153.718	N_2O
26	2153.909	solar CO
27	2154.006	solar CO
28	2154.115	H_2O?
29	2154.593	CO, solar CO
30	2154.713	N_2O, H_2O
31	2154.969	H_2O, solar CO
32	2155.052	?
33	2155.157	N_2O
34	2155.283	solar CO
35	2155.443	solar CO
36	2155.700	N_2O, solar CO
37	2155.969	?
38	2156.360	solar CO, N_2O
39	2156.567	H_2O, CO
40	2156.690	N_2O, solar CO
41	2156.925	solar CO, N_2O
42	2157.014	N_2O
43	2157.119	?
44	2157.237	solar CO, N_2O
45	2157.482	N_2O, solar CO
46	2157.689	N_2O
47	2157.844	solar CO
48	2157.944	O_3
49	2158.140	N_2O, H_2O
50	2158.296	CO, solar CO
51	2158.668	N_2O
52	2158.751	N_2O
53	2158.916	N_2O
54	2158.989	solar CO
55	2159.121	solar CO?
56	2159.297	solar CO, N_2O
57	2159.466	solar CO
58	2159.541	solar CO, CO
59	2159.640	N_2O
60	2159.738	solar CO

FRAME 56 (2150-2175 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
61	2159.957	solar CO, H_2O
62	2160.054	solar CO
63	2160.172	N_2O
64	2160.323	N_2O, solar CO
65	2160.420	N_2O
66	2160.506	N_2O
67	2160.608	N_2O
68	2160.707	H_2O, N_2O
69	2160.928	N_2O
70	2161.039	O_3
71	2161.121	solar CO
72	2161.231	O_3, N_2O
73	2161.343	solar CO
74	2161.440	N_2O, solar CO
75	2161.572	N_2O
76	2161.707	H_2O
77	2161.971	CO, H_2O, solar CO
78	2162.435	solar CO
79	2162.514	N_2O, CO, solar CO
80	2162.651	N_2O, solar CO
81	2162.884	H_2O, N_2O
82	2163.081	solar CO
83	2163.195	N_2O
84	2163.429	H_2O, N_2O
85	2163.694	solar CO, N_2O
86	2163.878	N_2O
87	2164.010	N_2O, solar CO
88	2164.149	N_2O
89	2164.224	solar CO
90	2164.315	solar CO
91	2164.407	N_2O, solar CO
92	2164.544	solar CO
93	2164.630	N_2O
94	2164.747	N_2O
95	2164.922	solar CO
96	2165.026	N_2O
97	2165.117	N_2O, CO
98	2165.323	N_2O
99	2165.598	CO, solar CO
100	2165.942	solar CO
101	2166.037	solar CO
102	2166.132	N_2O, solar CO
103	2166.246	N_2O
104	2166.381	N_2O, solar CO
105	2166.483	?
106	2166.706	N_2O
107	2166.808	solar CO, N_2O
108	2166.939	solar CO
109	2167.060	N_2O, solar CO
110	2167.169	N_2O
111	2167.249	N_2O, solar CO
112	2167.345	N_2O, H_2O
113	2167.534	N_2O
114	2167.752	N_2O, H_2O
115	2167.878	N_2O
116	2167.978	solar CO
117	2168.073	N_2O
118	2168.250	N_2O
119	2168.292	N_2O, solar CO
120	2168.420	N_2O, CO, solar CO

FRAME 56 (2150-2175 cm^{-1})
Continued

Seq. No.	ν(observed) (cm^{-1})	Identification
121	2168.502	N_2O
122	2168.745	N_2O
123	2168.994	N_2O
124	2169.197	CO, solar CO
125	2169.385	solar CO
126	2169.527	N_2O
127	2169.631	N_2O, solar CO
128	2169.779	N_2O
129	2169.884	N_2O, solar CO
130	2169.952	N_2O
131	2170.138	solar CO
132	2170.366	N_2O, solar CO
133	2170.482	O_3
134	2170.644	N_2O
135	2170.750	N_2O
136	2171.135	N_2O
137	2171.254	H_2O, solar CO
138	2171.360	N_2O
139	2171.645	N_2O
140	2171.739	N_2O, solar CO
141	2171.831	N_2O, solar CO
142	2171.940	N_2O
143	2172.079	solar CO, N_2O
144	2172.227	H_2O, solar CO
145	2172.319	N_2O
146	2172.521	N_2O
147	2172.757	CO, N_2O, solar CO
148	2172.890	N_2O, solar CO
149	2172.989	solar CO, N_2O
150	2173.103	solar CO
151	2173.207	?
152	2173.405	N_2O
153	2173.493	N_2O, solar CO
154	2173.713	solar CO, N_2O
155	2173.824	N_2O, solar CO
156	2173.930	N_2O, solar CO
157	2174.003	N_2O, solar CO
158	2174.227	N_2O, solar CO
159	2174.392	N_2O
160	2174.666	N_2O
161	2174.826	solar CO, N_2O