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Theoretical Simulation of Solar Spectra in the Middle Ultraviolet and Visible for Atmospheric Trace Constituent Measurements

NASA Langley

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Final Report

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Submitted by

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15 April 1978

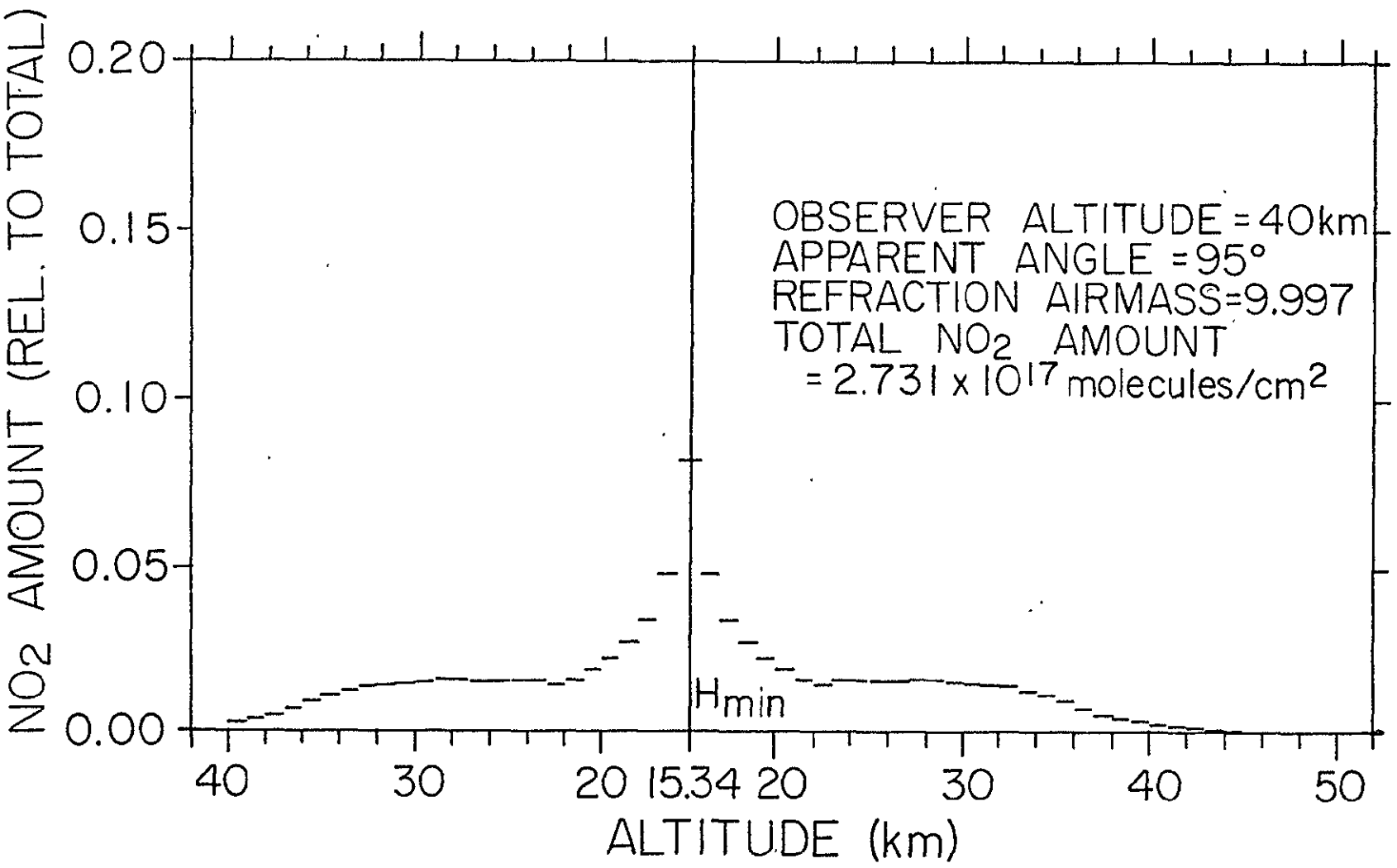

Figure 4. NO_2 distribution for a 94° path from 40 km altitude.

Studies have been made of the ultraviolet and visible solar spectra obtained during two recent balloon flights. The first flight was on 9 February 1977 (sponsored by NASA Langley), and the second flight was on 17 February 1977 (sponsored by the Manufacturing Chemists Association). Both flights covered the UV (2800Å - 3500Å) at ~0.3Å resolution and the visible at ~0.6Å resolution. The first flight reached a float altitude of ~40 km, while the second reached ~30 km. Numerous scans were obtained during ascent and from float for both flights. The different float altitudes mean that the major portion of the sunset optical paths are at different altitudes below the balloon.

All the spectral scans obtained at float, from high sun to low sun, have been calibrated in wavelength by using several standard solar spectra for line position references. As an example, Figs. 1 and 2 show sections of the mathematically filtered data of the AFGL atlas[1] used for calibration. In this way, ~40 scans from each flight were calibrated. The calibrated data plots, given as amplitude vs. wavelength, are presented elsewhere.

To anticipate possible identification and quantification of some atmospheric absorption features, absorption coefficients for O_3 and NO_2 were compiled from published and unpublished results. The immediate conclusion is that the available absorption coefficients for both O_3 and NO_2 are far from being satisfactory. In particular, the fine structure patterns in the spectral regions of interest are not yet available.

The sources that could give consistent absorption coefficients over a wide spectral range are Hall and Blacet,[2] Wilkerson et al.,[3] Bass et al.,[4] and Johnston and Graham[5] for NO_2; and Johnston and Graham[5] and Vigroux[6-8] for O_3. The O_3 values also include the AFCRL tabulations.[9, 10] Unfortunately, some of these sources have not tabulated their values, so that the values read from their small graphs

are unnecessarily in large error. The compiled tables and plots of the absorption coefficients are given in Tables I - VII and in Figures 3 - 12. The plots show the 3500 - 6000 Å region only.

Comparisons of low sun scans and high sun scans show significant atmospheric continuum extinction and have the potential of being used to identify atmospheric lines superimposed on the attenuated solar spectrum. This is complicated by the fact that the solar spectrum itself is very rich in line structure in the UV-visible range. Examples of the 9 February high resolution spectra obtained at high and low sun are shown in Figs. 1 and 2 of Appendix I for the 4400 to 4500 Å region. The amplitude range has been attenuated significantly during the sunset period. Examination of the fine structure behavior during sunset on both flights shows only minute changes in relative intensity patterns of the solar lines; thus, the identification of the atmospheric line structure on these spectra is not straightforward. It was useful to mathematically degrade the resolution to ~5 Å to better see the broad band atmospheric extinction. This low resolution is also appropriate for the available low resolution absorption coefficients of NO_2 and O_3, allowing the identification of NO_2 and O_3 features on the sunset spectra.

The NO_2 features were then used to derive the NO_2 mixing ratio profile in the 20 to 40 km range. The NO_2 results are published[11] and are here as Appendix I. Due to a shortage of space in the journal, a few important details were omitted there. These are presented in Appendix II.

Acknowledgment is made to Frederick Fernald and Darwin Rolens for computer work on the data analysis. The figures were prepared by Carolyn Bauer.

References

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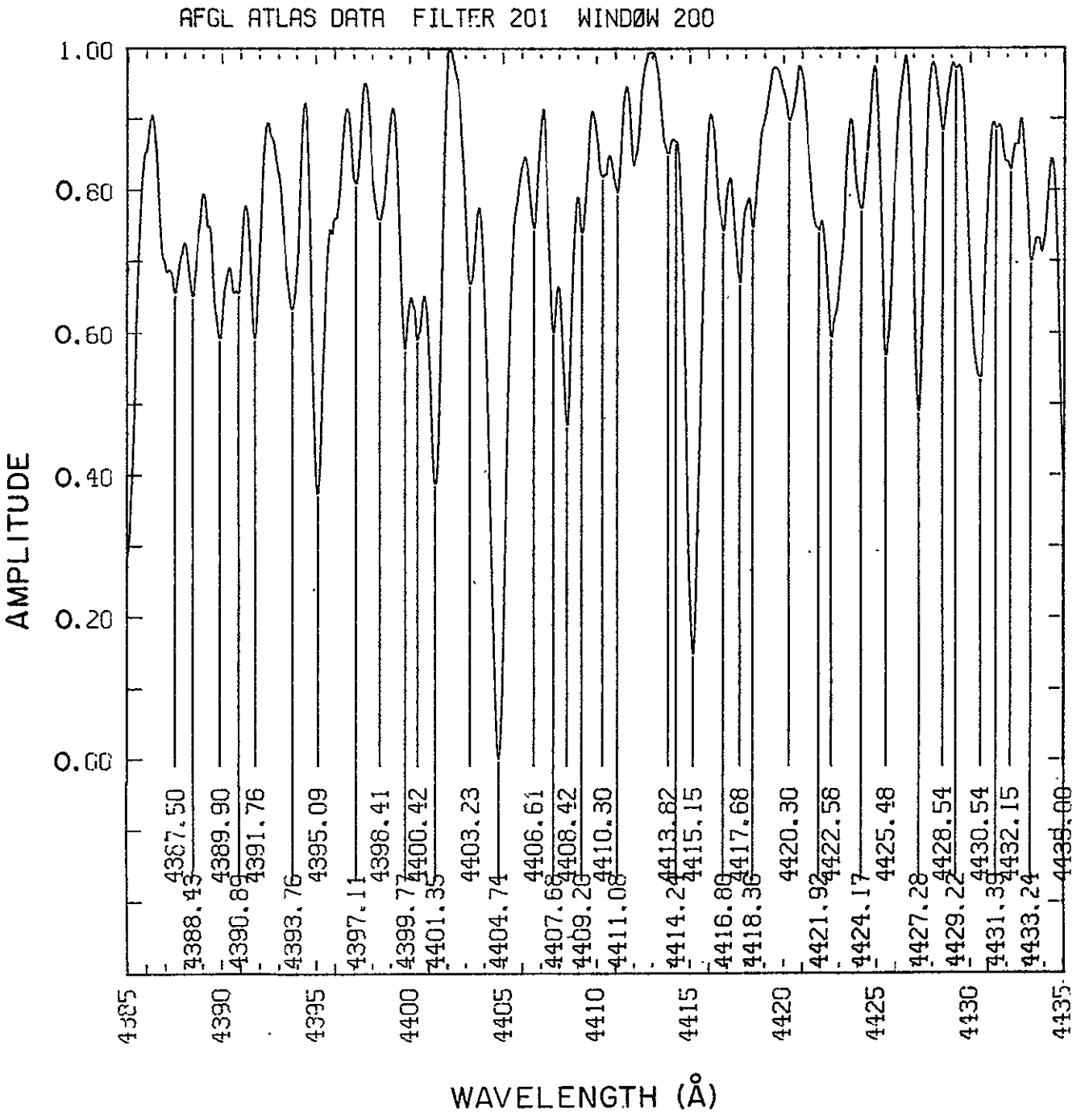

Figure 1. A section of the solar spectrum from the AFGL atlas[1] degraded in resolution to ~0.6Å.

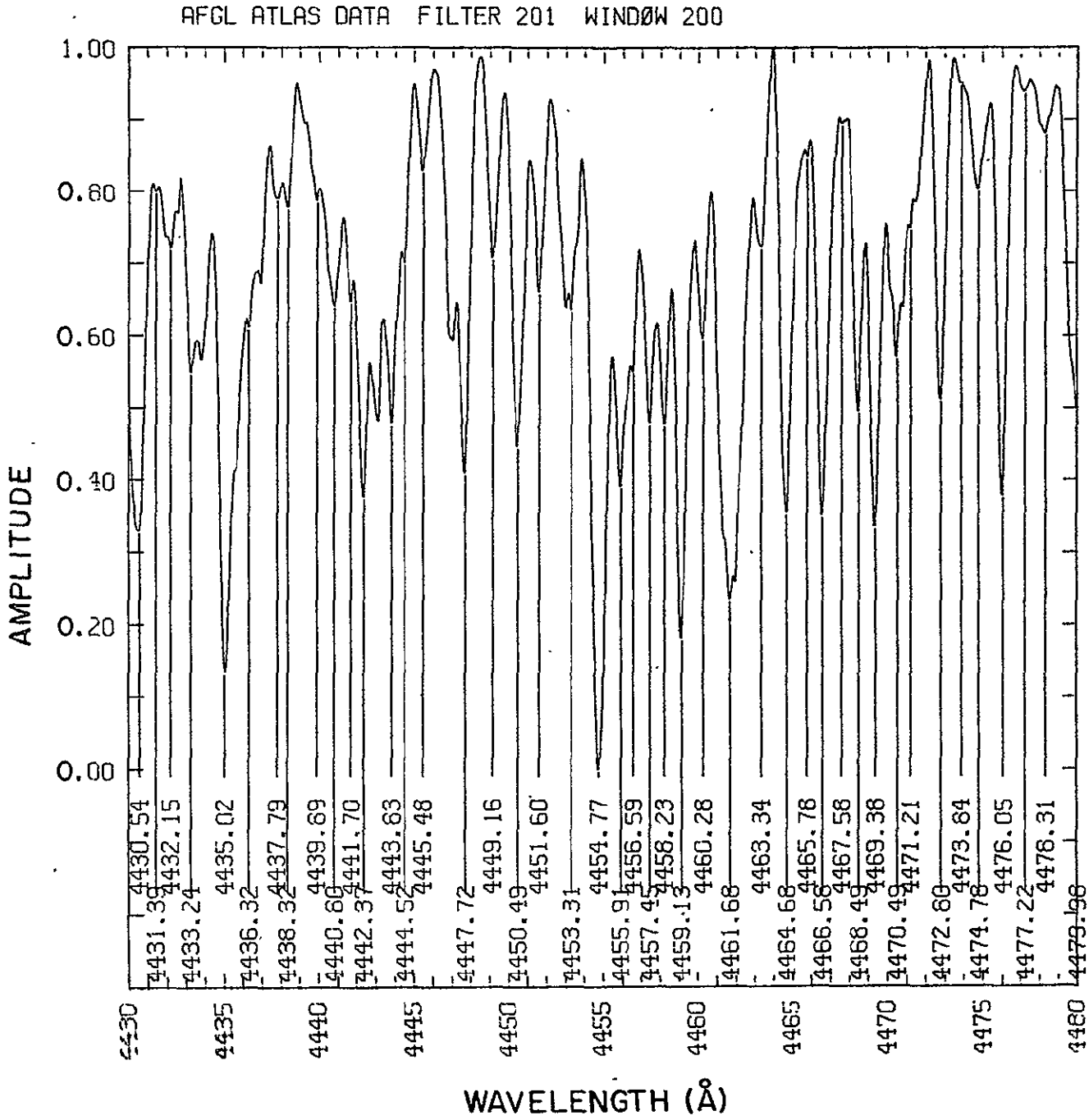

Figure 2. A section of the solar spectrum from the AFGL atlas[1] degraded in resolution to ~0.6Å.

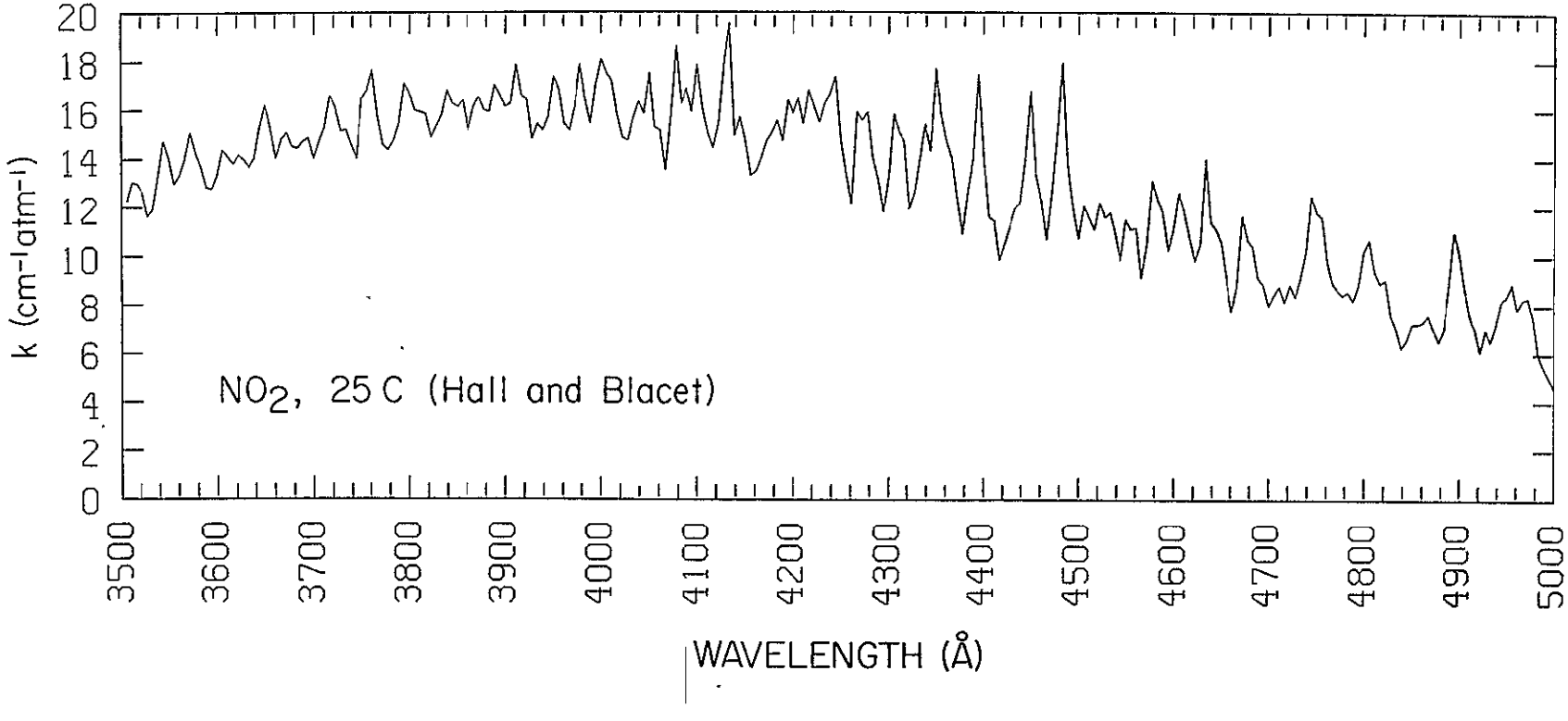

Figure 3. Absorption coefficients of NO_2.

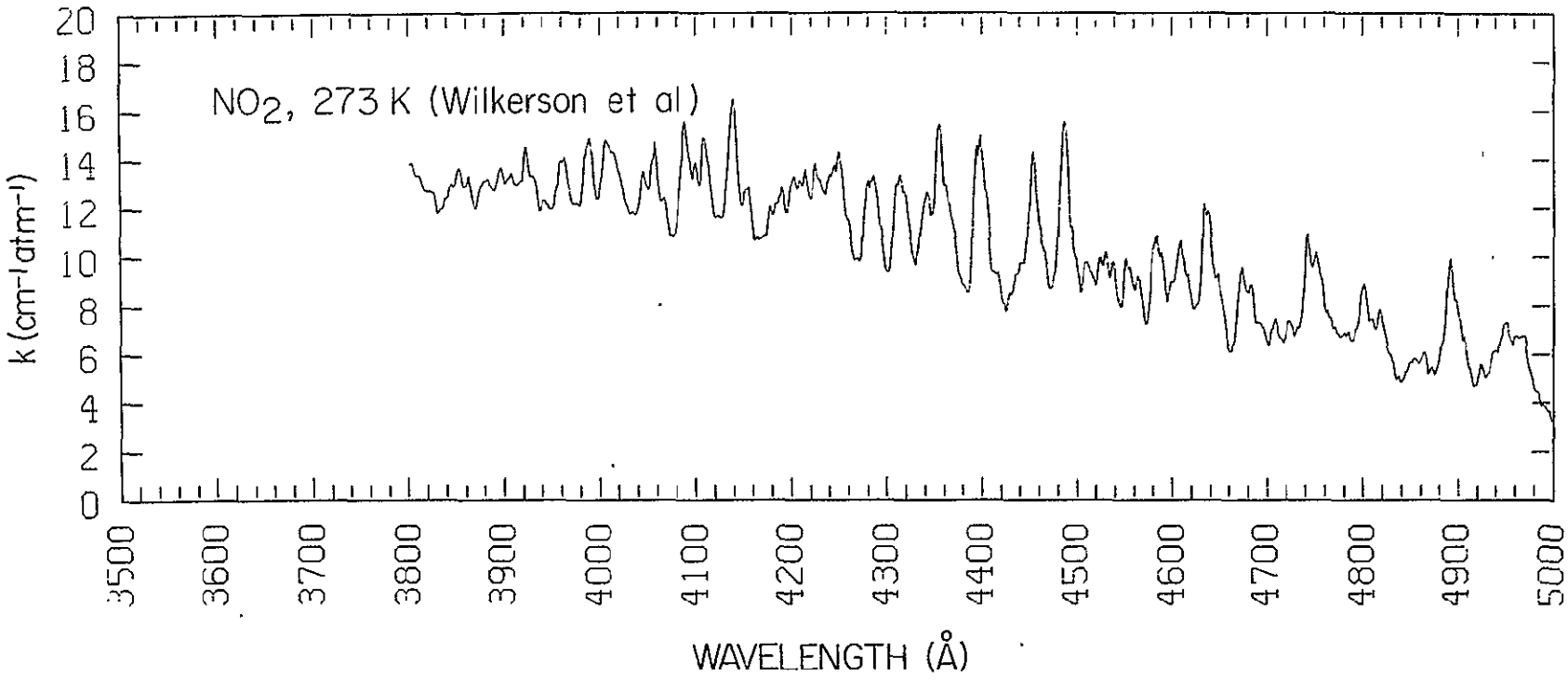

Figure 4. Absorption coefficients of NO_2.

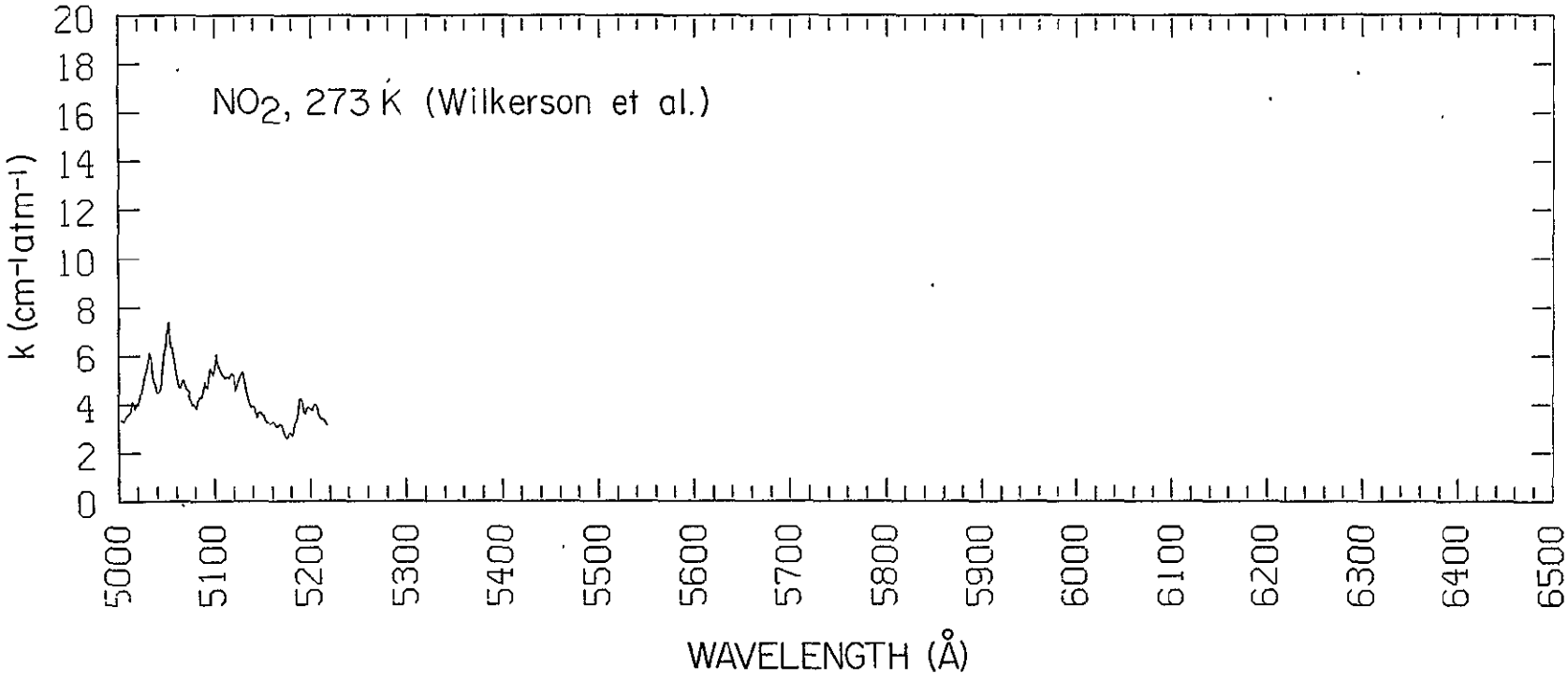

Figure 5. Absorption coefficients of NO_2.

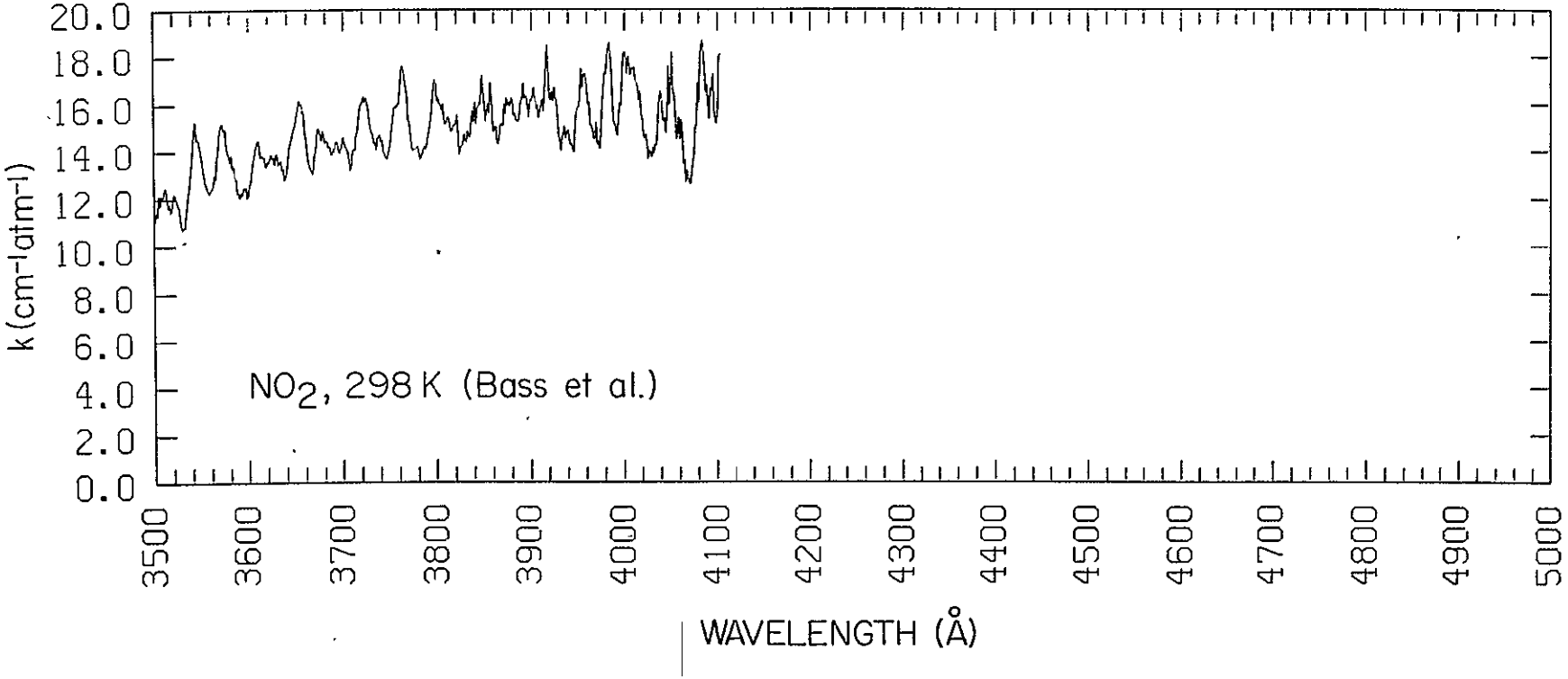

Figure 6. Absorption coefficients of NO_2.

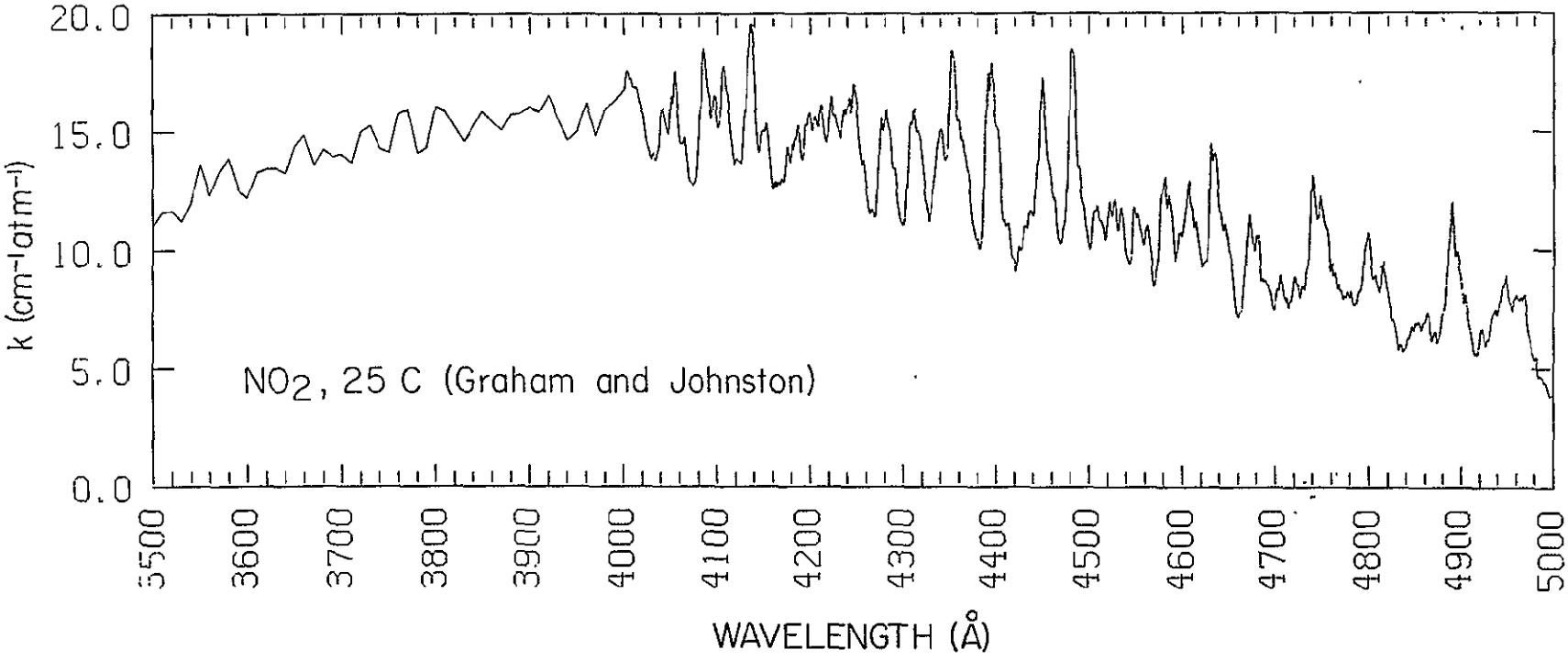

Figure 7. Absorption coefficients of NO_2.

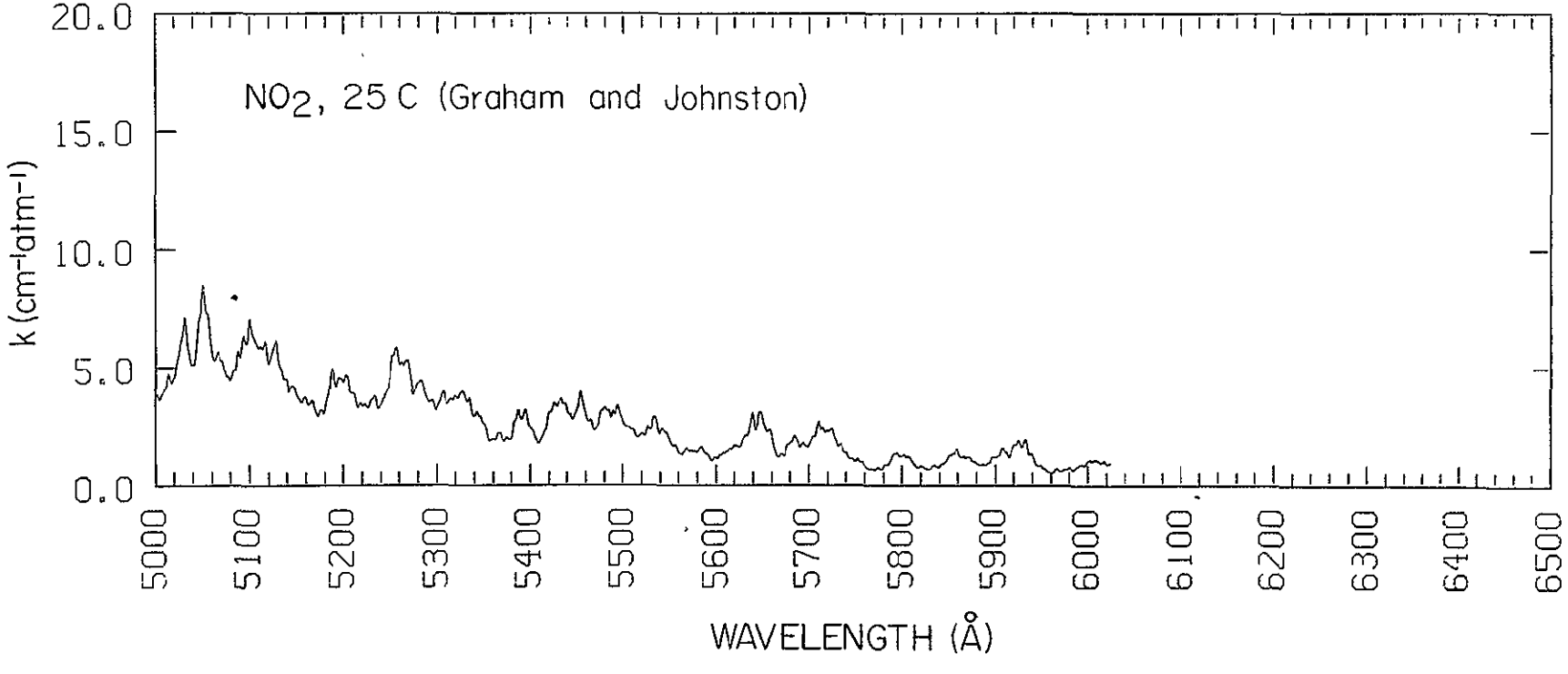

Figure 8. Absorption coefficients of NO_2.

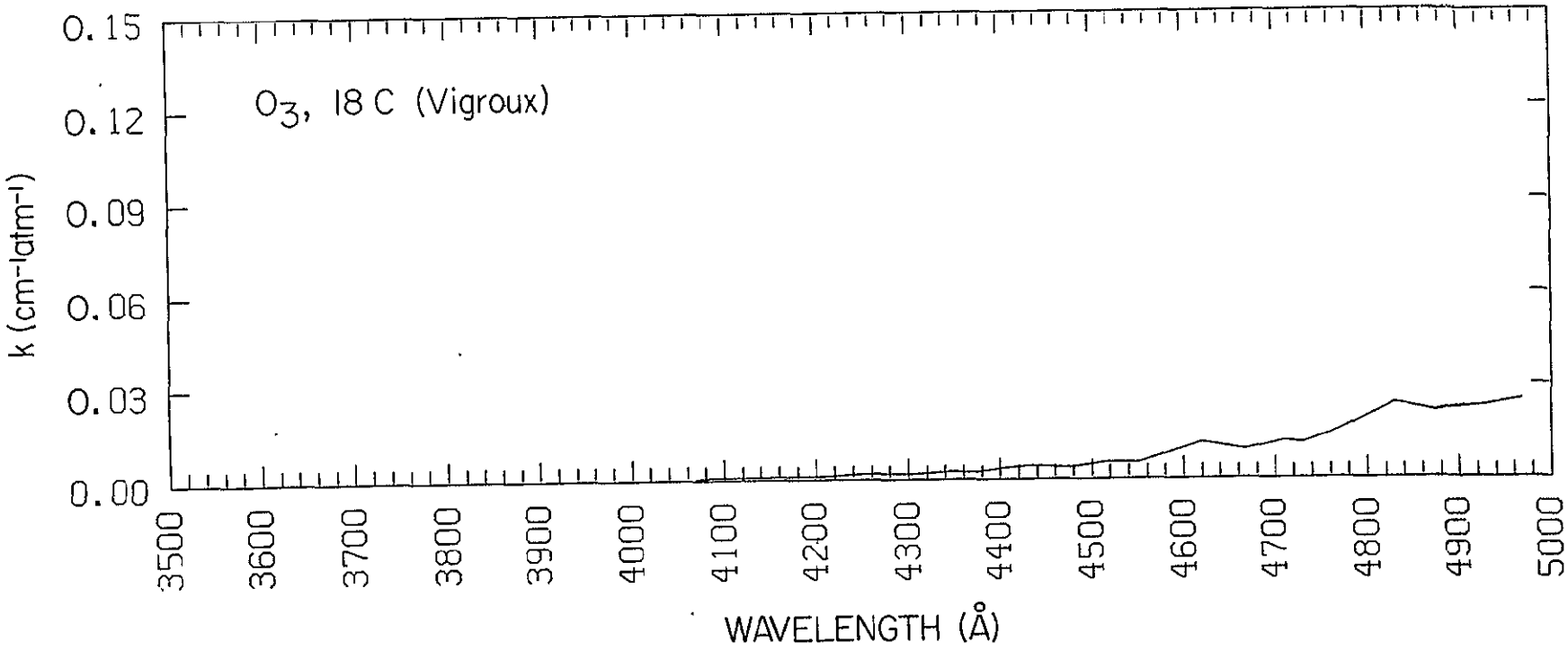

Figure 9. Absorption coefficients of O_3.

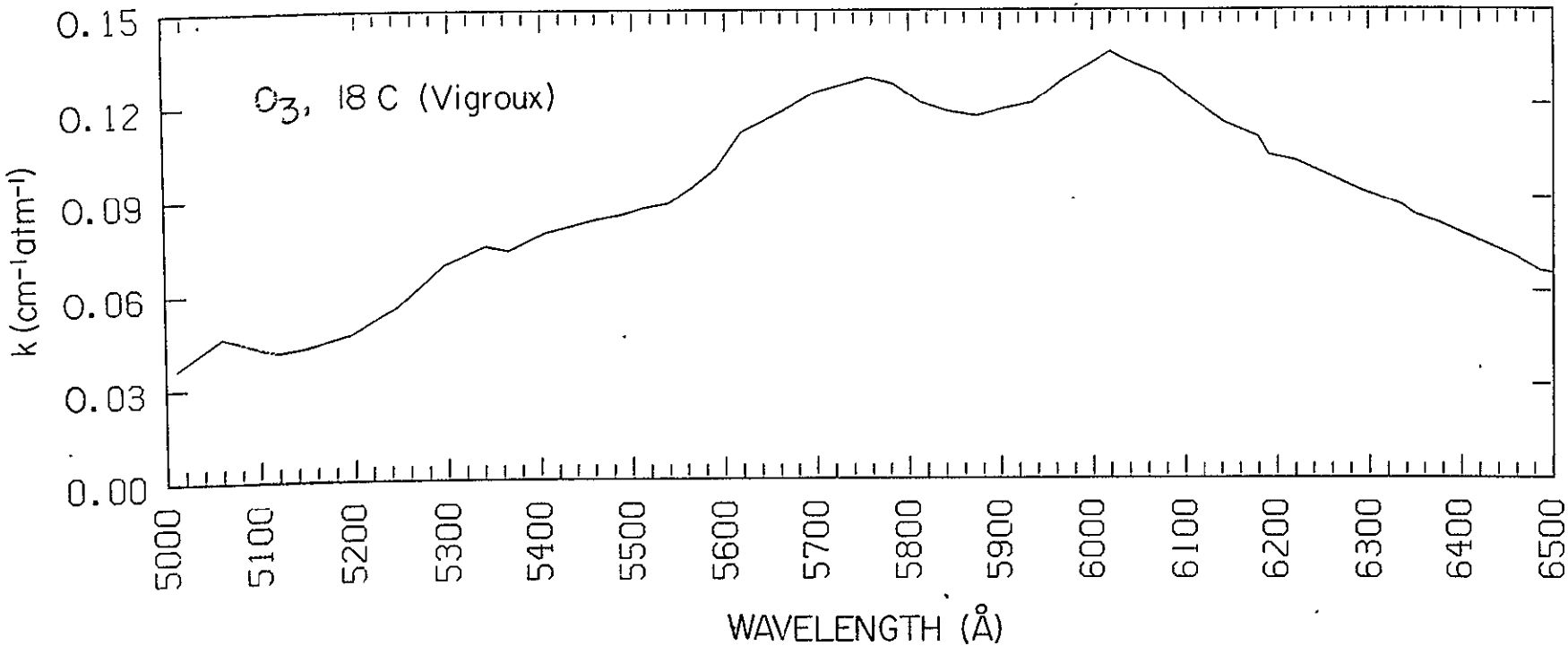

Figure 10. Absorption coefficients of O_3.

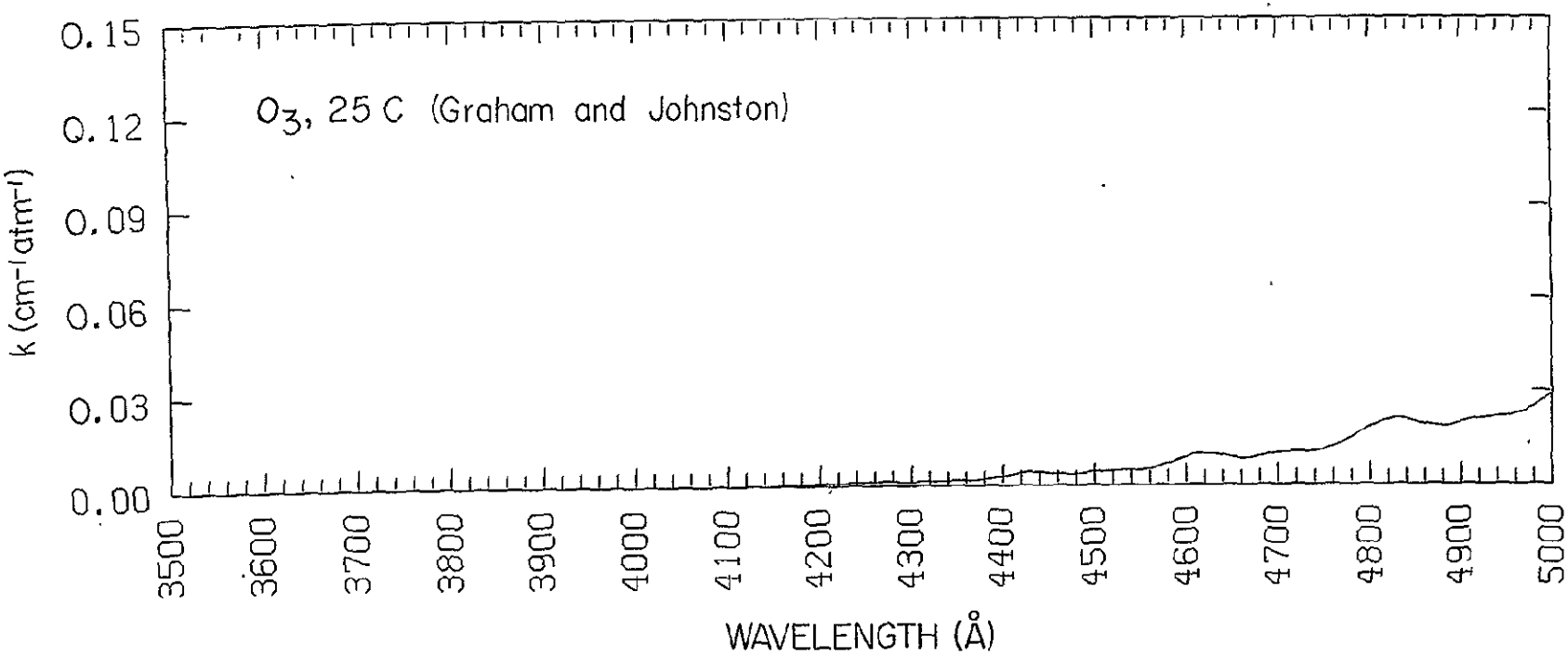

Figure 11. Absorption coefficients of O_3.

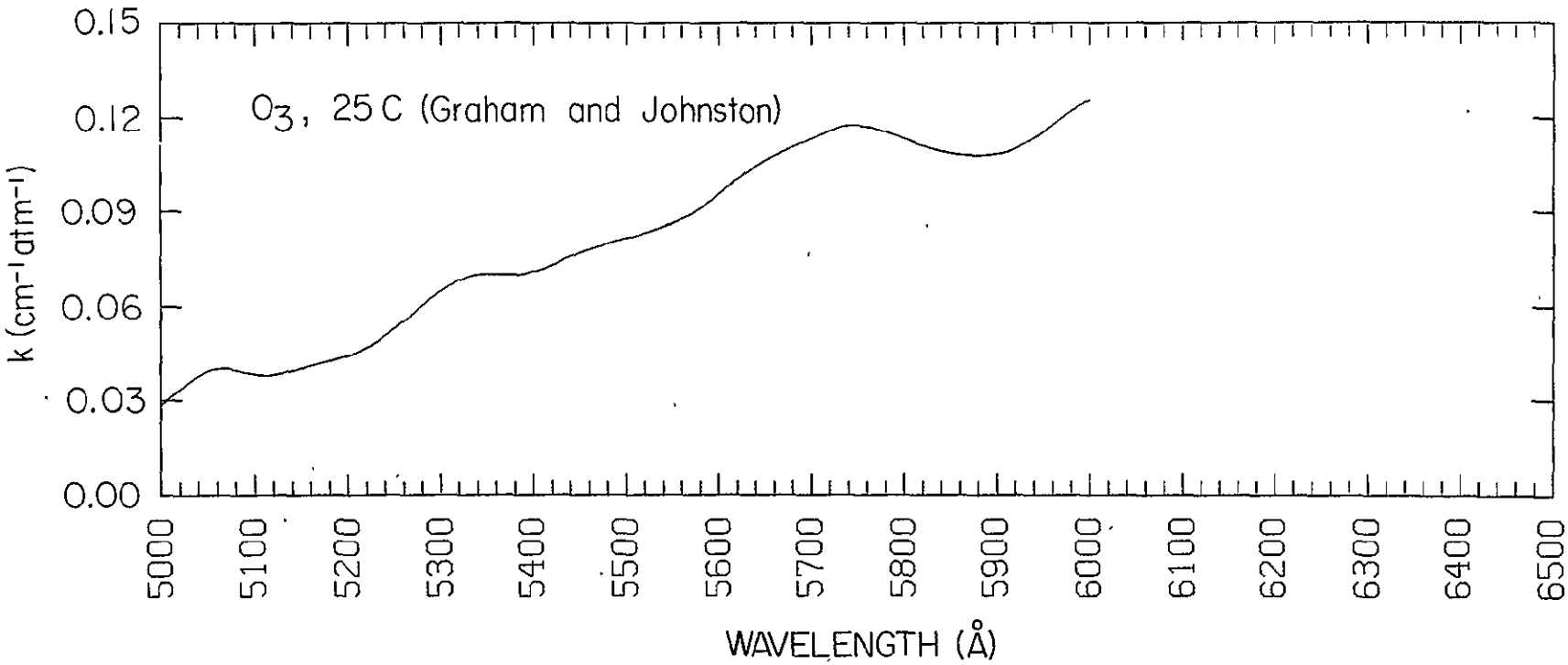

Figure 12. Absorption coefficients of O_3.

Table I. NO2 HALL AND BLACET DATA AT 25C

WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)
3205.6	7.0011E+00	3483.3	1.3302E+01	3761.1	1.7643E+01	4038.9	1.6313E+01
3211.1	7.3512E+00	3488.9	1.4002E+01	3766.7	1.5753E+01	4044.4	1.5823E+01
3216.7	7.6312E+00	3494.4	1.2952E+01	3772.2	1.4562E+01	4050.0	1.7503E+01
3222.2	7.4912E+00	3500.0	1.1832E+01	3777.8	1.4352E+01	4055.6	1.5262E+01
3227.8	7.3512E+00	3505.6	1.2252E+01	3783.3	1.4702E+01	4061.1	1.5122E+01
3233.3	7.6312E+00	3511.1	1.3022E+01	3788.9	1.5402E+01	4066.7	1.3512E+01
3238.9	7.9113E+00	3516.7	1.2952E+01	3794.4	1.7083E+01	4072.2	1.5753E+01
3244.4	7.7712E+00	3522.2	1.2602E+01	3800.0	1.6663E+01	4077.8	1.8623E+01
3250.0	7.7012E+00	3527.8	1.1622E+01	3805.6	1.5963E+01	4083.3	1.6243E+01
3255.6	8.3313E+00	3533.3	1.1902E+01	3811.1	1.5893E+01	4088.9	1.6873E+01
3261.1	8.4714E+00	3538.9	1.3302E+01	3816.7	1.5823E+01	4094.4	1.5893E+01
3266.7	8.6114E+00	3544.4	1.4702E+01	3822.2	1.4842E+01	4100.0	1.7853E+01
3272.2	8.7514E+00	3550.0	1.4002E+01	3827.8	1.5332E+01	4105.6	1.6103E+01
3277.8	8.6114E+00	3555.6	1.2952E+01	3833.3	1.5753E+01	4111.1	1.5052E+01
3283.3	8.5414E+00	3561.1	1.3302E+01	3838.9	1.6803E+01	4116.7	1.4422E+01
3288.9	8.9614E+00	3566.7	1.4002E+01	3844.4	1.6243E+01	4122.2	1.5402E+01
3294.4	8.8914E+00	3572.2	1.5052E+01	3850.0	1.6103E+01	4127.8	1.7853E+01
3300.0	9.1015E+00	3577.8	1.4212E+01	3855.6	1.6383E+01	4133.3	1.9533E+01
3305.6	9.3815E+00	3583.3	1.3652E+01	3861.1	1.5122E+01	4138.9	1.4912E+01
3311.1	9.1015E+00	3588.9	1.2812E+01	3866.7	1.6103E+01	4144.4	1.5683E+01
3316.7	8.9614E+00	3594.4	1.2742E+01	3872.2	1.6523E+01	4150.0	1.4702E+01
3322.2	9.1015E+00	3600.0	1.3302E+01	3877.8	1.5963E+01	4155.6	1.3362E+01
3327.8	9.4515E+00	3605.6	1.4352E+01	3883.3	1.5893E+01	4161.1	1.3442E+01
3333.3	9.8016E+00	3611.1	1.4072E+01	3888.9	1.7013E+01	4166.7	1.4002E+01
3338.9	1.0782E+01	3616.7	1.3792E+01	3894.4	1.6593E+01	4172.2	1.4702E+01
3344.4	9.8016E+00	3622.2	1.4142E+01	3900.0	1.6103E+01	4177.8	1.5052E+01
3350.0	9.3815E+00	3627.8	1.3932E+01	3905.6	1.6243E+01	4183.3	1.5542E+01
3355.6	1.0502E+01	3633.3	1.3652E+01	3911.1	1.7853E+01	4188.9	1.4702E+01
3361.1	1.0152E+01	3638.9	1.4002E+01	3916.7	1.6593E+01	4194.4	1.6383E+01
3366.7	1.0432E+01	3644.4	1.5262E+01	3922.2	1.6383E+01	4200.0	1.5823E+01
3372.2	1.0502E+01	3650.0	1.6173E+01	3927.8	1.4772E+01	4205.6	1.6453E+01
3377.8	1.0222E+01	3655.6	1.5262E+01	3933.3	1.5402E+01	4211.1	1.5402E+01
3383.3	1.0012E+01	3661.1	1.4002E+01	3938.9	1.5122E+01	4216.7	1.6803E+01
3388.9	1.0502E+01	3666.7	1.4772E+01	3944.4	1.5683E+01	4222.2	1.6103E+01
3394.4	1.1832E+01	3672.2	1.5052E+01	3950.0	1.7363E+01	4227.8	1.5472E+01
3400.0	1.1282E+01	3677.8	1.4492E+01	3955.6	1.6803E+01	4233.3	1.6243E+01
3405.6	1.1412E+01	3683.3	1.4422E+01	3961.1	1.5402E+01	4238.9	1.6663E+01
3411.1	1.1762E+01	3688.9	1.4702E+01	3966.7	1.5122E+01	4244.4	1.7363E+01
3416.7	1.1972E+01	3694.4	1.4842E+01	3972.2	1.6103E+01	4250.0	1.4702E+01
3422.2	1.1982E+01	3700.0	1.4002E+01	3977.8	1.7853E+01	4255.6	1.3302E+01
3427.8	1.1202E+01	3705.6	1.4702E+01	3983.3	1.6453E+01	4261.1	1.2112E+01
3433.3	1.0502E+01	3711.1	1.5262E+01	3988.9	1.5402E+01	4266.7	1.5893E+01
3438.9	1.1282E+01	3716.7	1.6593E+01	3994.4	1.7013E+01	4272.2	1.5542E+01
3444.4	1.1552E+01	3722.2	1.6103E+01	4000.0	1.8063E+01	4277.8	1.5893E+01
3450.0	1.1692E+01	3727.8	1.5122E+01	4005.6	1.7503E+01	4283.3	1.4002E+01
3455.6	1.1902E+01	3733.3	1.5192E+01	4011.1	1.7153E+01	4288.9	1.3092E+01
3461.1	1.1972E+01	3738.9	1.4562E+01	4016.7	1.5753E+01	4294.4	1.1762E+01
3466.7	1.2672E+01	3744.4	1.4002E+01	4022.2	1.4842E+01	4300.0	1.3302E+01
3472.2	1.2532E+01	3750.0	1.6453E+01	4027.8	1.4702E+01	4305.6	1.5823E+01
3477.8	1.2392E+01	3755.6	1.6803E+01	4033.3	1.5612E+01	4311.1	1.5052E+01

Table I. NO2 HALL AND BLACET DATA AT 25C

WVLGTH (A)	ABSORBTION COEFFICIENT (CM-1 ATM-1)	WVLGTH (A)	ABSORBTION COEFFICIENT (CM-1 ATM-1)	WVLGTH (A)	ABSORBTION COEFFICIENT (CM-1 ATM-1)
4316.7	1.4702E+01	4594.4	1.0222E+01	4805.6	1.0642E+01
4322.2	1.1902E+01	4600.0	1.1132E+01	4811.1	9.3815E+00
4327.8	1.2602E+01	4605.6	1.2602E+01	4816.7	8.8914E+00
4333.3	1.4002E+01	4611.1	1.1762E+01	4822.2	9.0314E+00
4338.9	1.5402E+01	4616.7	1.0712E+01	4827.8	7.5612E+00
4344.4	1.4282E+01	4622.2	9.8016E+00	4833.3	7.0011E+00
4350.0	1.7713E+01	4627.8	1.0502E+01	4838.9	6.2310E+00
4355.6	1.5753E+01	4633.3	1.4002E+01	4844.4	6.5811E+00
4361.1	1.4702E+01	4638.9	1.1342E+01	4850.0	7.2112E+00
4366.7	1.4002E+01	4644.4	1.1062E+01	4855.6	7.2112E+00
4372.2	1.2322E+01	4650.0	1.0502E+01	4861.1	7.2812E+00
4377.8	1.0852E+01	4655.6	9.1015E+00	4866.7	7.5612E+00
4383.3	1.2602E+01	4594.4	1.0222E+01	4872.2	7.0011E+00
4388.9	1.4002E+01	4600.0	1.1132E+01	4877.8	6.5110E+00
4394.4	1.7503E+01	4605.6	1.2602E+01	4883.3	7.0011E+00
4400.0	1.4002E+01	4611.1	1.1762E+01	4888.9	8.7514E+00
4405.6	1.1552E+01	4616.7	1.0712E+01	4894.4	1.0992E+01
4411.1	1.1412E+01	4622.2	9.8016E+00	4900.0	1.0152E+01
4416.7	9.8016E+00	4627.8	1.0502E+01	4905.6	8.7514E+00
4422.2	1.0502E+01	4633.3	1.4002E+01	4911.1	7.5612E+00
4427.8	1.1202E+01	4638.9	1.1342E+01	4916.7	7.0011E+00
4433.3	1.1902E+01	4644.4	1.1062E+01	4922.2	6.0910E+00
4438.9	1.2182E+01	4650.0	1.0502E+01	4927.8	7.0011E+00
4444.4	1.4002E+01	4655.6	9.1015E+00	4933.3	6.5110E+00
4450.0	1.6803E+01	4661.1	7.7012E+00		
4455.6	1.3302E+01	4666.7	8.7514E+00		
4461.1	1.2252E+01	4672.2	1.1622E+01		
4466.7	1.0642E+01	4677.8	1.0642E+01		
4472.2	1.2602E+01	4683.3	1.0362E+01		
4477.8	1.5052E+01	4688.9	9.1015E+00		
4483.3	1.7923E+01	4694.4	8.8214E+00		
4488.9	1.3652E+01	4700.0	7.9813E+00		
4494.4	1.1902E+01	4705.6	8.4013E+00		
4500.0	1.0712E+01	4711.1	8.7514E+00		
4505.6	1.2042E+01	4716.7	8.1213E+00		
4511.1	1.1552E+01	4722.2	8.8214E+00		
4516.7	1.1062E+01	4727.8	8.3313E+00		
4522.2	1.2182E+01	4733.3	9.1015E+00		
4527.8	1.1552E+01	4738.9	1.0152E+01		
4533.3	1.1762E+01	4744.4	1.2462E+01		
4538.9	1.0852E+01	4750.0	1.1762E+01		
4544.4	9.8016E+00	4755.6	1.1552E+01		
4550.0	1.1482E+01	4761.1	9.8016E+00		
4555.6	1.1062E+01	4766.7	8.8914E+00		
4561.1	1.1132E+01	4772.2	8.6114E+00		
4566.7	9.1015E+00	4777.8	8.4013E+00		
4572.2	1.0502E+01	4783.3	8.5414E+00		
4577.8	1.3092E+01	4788.9	8.1913E+00		
4583.3	1.2322E+01	4794.4	8.8214E+00		
4588.9	1.1762E+01	4800.0	1.0222E+01		

Table II. NO2 BASS ET AL. DATA AT 235K, 298K

WAVLGTH (A)	ABSOR.COEFF. (CM-1 ATM-1) 235K	298K	WAVLGTH (A)	ABSOR.COEFF. (CM-1 ATM-1) 235K	298K	WAVLGTH (A)	ABSOR.COEFF. (CM-1 ATM-1) 235K	298K	WAVLGTH (A)	ABSOR.COEFF. (CM-1 ATM-1) 235K	298K
3000.00	3.15	2.93	3062.50	4.17	3.69	3125.00	5.60	5.03	3187.50	6.15	5.82
3001.25	3.37	2.98	3063.75	4.32	4.10	3126.25	5.40	4.77	3188.75	6.04	5.81
3002.50	3.01	2.37	3065.00	3.69	3.98	3127.50	5.56	5.25	3190.00	6.22	5.85
3003.75	3.17	2.99	3066.25	3.98	3.60	3128.75	5.42	5.19	3191.25	6.42	6.49
3005.00	3.38	2.86	3067.50	4.31	3.74	3130.00	5.47	5.15	3192.50	6.38	5.77
3006.25	3.27	3.32	3068.75	4.32	4.21	3131.25	5.45	5.15	3193.75	6.41	5.74
3007.50	3.25	3.03	3070.00	4.39	3.96	3132.50	5.26	4.88	3195.00	6.55	6.23
3008.75	3.29	2.96	3071.25	4.46	4.50	3133.75	5.15	4.89	3196.25	6.70	6.51
3010.00	3.30	3.27	3072.50	4.61	4.56	3135.00	5.68	5.04	3197.50	6.77	6.34
3011.25	3.28	3.25	3073.75	4.48	5.19	3136.25	5.37	4.94	3198.75	6.57	6.43
3012.50	3.18	2.72	3075.00	4.53	4.23	3137.50	5.13	4.92	3200.00	6.82	6.31
3013.75	3.49	2.99	3076.25	4.73	4.43	3138.75	5.42	5.31	3201.25	7.08	6.53
3015.00	3.50	2.71	3077.50	4.35	3.78	3140.00	5.22	4.96	3202.50	7.06	5.98
3016.25	3.65	3.05	3078.75	4.45	4.38	3141.25	5.30	5.13	3203.75	7.16	6.44
3017.50	3.71	3.67	3080.00	4.35	4.47	3142.50	5.52	5.43	3205.00	7.41	6.86
3018.75	3.64	3.38	3081.25	4.51	3.63	3143.75	5.41	5.43	3206.25	6.75	6.32
3020.00	3.73	3.51	3082.50	4.33	4.44	3145.00	5.68	5.01	3207.50	6.86	6.29
3021.25	3.98	3.41	3083.75	4.39	3.85	3146.25	5.91	5.14	3208.75	6.66	6.35
3022.50	3.55	3.54	3085.00	4.42	3.90	3147.50	5.92	5.36	3210.00	7.13	5.52
3023.75	3.86	3.25	3086.25	4.67	4.29	3148.75	5.95	5.49	3211.25	6.91	5.15
3025.00	4.10	3.70	3087.50	4.78	4.42	3150.00	6.05	5.89	3212.50	6.77	5.51
3026.25	3.93	3.84	3088.75	4.86	4.93	3151.25	6.01	5.20	3213.75	6.59	5.67
3027.50	4.03	3.42	3090.00	4.94	4.99	3152.50	6.02	5.65	3215.00	6.70	5.41
3028.75	3.97	4.19	3091.25	5.01	4.35	3153.75	5.90	5.74	3216.25	7.26	6.16
3030.00	4.28	4.50	3092.50	4.88	4.87	3155.00	5.77	5.56	3217.50	7.18	4.92
3031.25	4.11	3.73	3093.75	5.12	5.17	3156.25	5.82	5.29	3218.75	6.87	6.35
3032.50	3.93	3.85	3095.00	5.03	4.59	3157.50	5.61	4.97	3220.00	7.12	5.94
3033.75	4.06	3.96	3096.25	5.12	5.00	3158.75	5.81	5.26	3221.25	6.98	5.91
3035.00	4.13	3.65	3097.50	5.06	4.76	3160.00	5.73	5.04	3222.50	6.69	5.73
3036.25	4.23	4.11	3098.75	4.78	4.83	3161.25	5.92	4.60	3223.75	7.48	6.01
3037.50	4.15	4.34	3100.00	4.72	4.91	3162.50	5.84	4.95	3225.00	7.76	6.22
3038.75	4.42	4.12	3101.25	4.78	4.37	3163.75	5.50	5.26	3226.25	7.21	5.94
3040.00	4.29	3.90	3102.50	4.91	4.41	3165.00	5.60	5.08	3227.50	7.54	6.40
3041.25	4.23	3.95	3103.75	4.90	5.06	3166.25	5.78	5.45	3228.75	7.17	5.64
3042.50	4.01	3.91	3105.00	4.97	4.60	3167.50	5.93	5.54	3230.00	7.44	6.56
3043.75	4.02	4.15	3106.25	5.18	4.41	3168.75	6.03	5.74	3231.25	7.11	6.09
3045.00	4.24	3.79	3107.50	5.19	5.06	3170.00	6.26	6.40	3232.50	7.03	6.34
3046.25	4.02	4.01	3108.75	4.90	5.02	3171.25	5.91	6.39	3233.75	6.91	6.03
3047.50	4.04	3.50	3110.00	5.05	4.56	3172.50	5.92	5.94	3235.00	7.24	6.12
3048.75	4.13	3.94	3111.25	5.15	4.64	3173.75	6.32	6.28	3236.25	6.69	6.37
3050.00	4.45	4.48	3112.50	5.15	4.82	3175.00	6.63	6.83	3237.50	6.98	6.12
3051.25	4.20	3.69	3113.75	5.24	4.85	3176.25	6.56	6.18	3238.75	6.60	5.66
3052.50	4.17	3.38	3115.00	5.47	4.85	3177.50	6.48	6.36	3240.00	7.19	6.02
3053.75	4.08	3.53	3116.25	5.15	4.73	3178.75	6.64	6.15	3241.25	7.15	5.97
3055.00	4.32	3.81	3117.50	5.34	4.69	3180.00	6.67	6.47	3242.50	7.34	5.98
3056.25	4.09	3.82	3118.75	5.32	4.77	3181.25	6.52	6.04	3243.75	7.57	5.93
3057.50	4.11	4.11	3120.00	5.27	5.75	3182.50	6.46	5.93	3245.00	7.09	6.06
3058.75	3.83	3.69	3121.25	5.40	5.17	3183.75	6.41	6.23	3246.25	7.19	6.54
3060.00	4.25	4.02	3122.50	5.61	6.10	3185.00	6.17	6.13	3247.50	7.45	6.42
3061.25	4.19	3.13	3123.75	5.92	5.29	3186.25	6.18	6.02	3248.75	7.46	5.95

Table II. NO2 BASS ET AL. DATA AT 235K, 298K

WAVLGTH (A)	ABSOR.COEFF. (CM-1 ATM-1) 235K	298K	WAVLGTH (A)	ABSOR.COEFF. (CM-1 ATM-1) 235K	298K	WAVLGTH (A)	ABSOR.COEFF. (CM-1 ATM-1) 235K	298K	WAVLGTH (A)	ABSOR.COEFF. (CM-1 ATM-1) 235K	298K
3250.00	7.49	6.83	3312.50	8.37	7.38	3375.00	8.12	7.24	3437.50	10.62	9.45
3251.25	6.04	6.65	3313.75	8.50	7.32	3376.25	8.93	7.63	3438.75	10.69	8.53
3252.50	8.26	6.55	3315.00	8.33	6.74	3377.50	8.98	6.90	3440.00	10.91	8.79
3253.75	8.53	6.94	3316.25	8.60	6.84	3378.75	8.81	7.16	3441.25	10.33	8.61
3255.00	7.48	6.78	3317.50	8.43	6.95	3380.00	9.35	7.10	3442.50	10.52	8.84
3256.25	8.05	7.24	3318.75	8.39	6.68	3381.25	9.27	7.54	3443.75	10.41	8.87
3257.50	7.55	6.61	3320.00	8.08	7.10	3382.50	9.69	8.11	3445.00	10.64	8.53
3258.75	7.56	6.30	3321.25	8.44	7.12	3383.75	9.85	8.58	3446.25	10.82	8.74
3260.00	7.74	5.86	3322.50	8.50	7.86	3385.00	10.34	9.12	3447.50	10.93	8.46
3261.25	7.79	6.41	3323.75	8.99	7.76	3386.25	10.46	9.29	3448.75	11.03	8.68
3262.50	7.77	6.34	3325.00	9.39	8.38	3387.50	10.70	9.85	3450.00	10.94	9.21
3263.75	7.89	6.71	3326.25	9.94	7.84	3388.75	10.80	9.64	3451.25	11.22	9.25
3265.00	7.68	7.16	3327.50	10.05	8.80	3390.00	10.72	9.45	3452.50	10.92	9.54
3266.25	7.83	6.86	3328.75	10.20	8.83	3391.25	10.85	9.19	3453.75	10.74	8.87
3267.50	8.42	7.21	3330.00	10.02	8.76	3392.50	10.55	9.12	3455.00	10.95	9.01
3268.75	7.95	6.93	3331.25	9.77	9.10	3393.75	10.22	9.04	3456.25	10.86	9.05
3270.00	7.82	6.32	3332.50	9.79	8.70	3395.00	10.00	8.32	3457.50	11.11	9.72
3271.25	7.93	6.63	3333.75	9.21	8.83	3396.25	10.10	8.52	3458.75	11.30	9.41
3272.50	7.73	6.47	3335.00	9.23	7.64	3397.50	10.37	8.04	3460.00	11.54	9.57
3273.75	7.68	6.42	3336.25	8.83	7.80	3398.75	9.99	8.67	3461.25	11.67	9.36
3275.00	8.00	6.77	3337.50	8.69	7.38	3400.00	10.43	8.69	3462.50	11.72	9.74
3276.25	7.95	6.77	3338.75	8.46	7.57	3401.25	10.30	8.82	3463.75	11.61	9.93
3277.50	8.17	6.97	3340.00	8.01	6.98	3402.50	10.04	8.33	3465.00	12.06	10.05
3278.75	8.32	6.96	3341.25	8.14	6.60	3403.75	10.35	8.63	3466.25	12.36	10.10
3280.00	8.27	7.03	3342.50	8.35	7.20	3405.00	10.53	8.33	3467.50	11.99	10.22
3281.25	7.80	6.60	3343.75	8.33	7.51	3406.25	10.55	8.55	3468.75	11.63	10.32
3282.50	7.87	7.03	3345.00	8.29	7.85	3407.50	10.28	9.10	3470.00	11.50	9.94
3283.75	7.85	6.91	3346.25	8.56	7.56	3408.75	10.55	8.61	3471.25	11.68	9.80
3285.00	7.72	6.65	3347.50	9.00	7.62	3410.00	11.20	9.30	3472.50	11.46	9.57
3286.25	7.68	6.81	3348.75	9.11	8.74	3411.25	11.41	9.68	3473.75	11.53	9.48
3287.50	7.90	6.14	3350.00	9.26	8.43	3412.50	11.55	9.31	3475.00	11.29	9.71
3288.75	7.58	6.36	3351.25	9.12	7.82	3413.75	11.48	9.08	3476.25	11.32	9.50
3290.00	8.06	7.51	3352.50	9.67	7.89	3415.00	11.37	9.66	3477.50	11.59	9.89
3291.25	7.86	7.15	3353.75	9.17	7.83	3416.25	11.03	9.92	3478.75	11.82	10.09
3292.50	7.78	7.62	3355.00	8.83	7.66	3417.50	11.37	9.92	3480.00	12.96	10.69
3293.75	8.10	7.32	3356.25	9.01	7.79	3418.75	11.62	9.52	3481.25	13.46	11.51
3295.00	8.26	7.44	3357.50	8.85	8.03	3420.00	11.30	8.92	3482.50	13.84	12.33
3296.25	8.50	7.12	3358.75	8.89	7.15	3421.25	11.19	8.55	3483.75	14.33	13.15
3297.50	8.63	7.63	3360.00	9.43	7.86	3422.50	9.85	8.85	3485.00	14.65	12.55
3298.75	8.43	7.92	3361.25	9.09	6.92	3423.75	11.20	7.89	3486.25	13.68	12.14
3300.00	8.03	7.82	3362.50	9.40	7.49	3425.00	9.94	7.92	3487.50	13.15	11.77
3301.25	8.36	6.80	3363.75	9.06	8.12	3426.25	9.46	8.36	3488.75	12.56	11.21
3302.50	8.45	7.07	3365.00	9.32	8.59	3427.50	9.42	7.56	3490.00	12.40	10.43
3303.75	7.66	6.96	3366.25	9.53	6.33	3428.75	9.52	8.22	3491.25	11.84	10.46
3305.00	7.93	7.49	3367.50	9.60	8.43	3430.00	9.53	8.22	3492.50	11.22	9.31
3306.25	8.01	7.08	3368.75	9.62	7.53	3431.25	9.94	8.38	3493.75	10.78	8.94
3307.50	8.28	7.02	3370.00	9.31	7.17	3432.50	9.62	8.37	3495.00	10.75	9.70
3308.75	7.82	6.87	3371.25	9.37	8.14	3433.75	9.99	8.60	3496.25	10.68	8.72
3310.00	8.20	6.59	3372.50	9.24	7.33	3435.00	10.19	9.06	3497.50	10.68	8.64
3311.25	8.28	6.71	3373.75	9.13	7.64	3436.25	10.54	8.55	3498.75	10.63	9.13

Table II. NO2 BASS ET AL. DATA AT 235K, 296K

WAVLGTH (A)	ABSOR.COEFF. (CM-1 ATM-1) 235K	296K	WAVLGTH (A)	ABSOR.COEFF. (CM-1 ATM-1) 235K	296K	WAVLGTH (A)	ABSOR.COEFF. (CM-1 ATM-1) 235K	296K	WAVLGTH (A)	ABSOR.COEFF. (CM-1 ATM-1) 235K	296K
3500.00	11.02	8.37	3562.50	12.55	10.31	3625.00	13.66	11.98	3687.50	13.83	12.61
3501.25	11.13	9.52	3563.75	12.99	10.92	3626.25	13.73	12.03	3688.75	14.10	12.61
3502.50	11.46	9.67	3565.00	12.84	11.22	3627.50	13.43	11.86	3690.00	13.93	12.70
3503.75	11.29	10.24	3566.25	13.69	12.25	3628.75	13.85	12.16	3691.25	14.27	13.30
3505.00	12.13	10.32	3567.50	13.68	12.23	3630.00	13.77	12.22	3692.50	14.42	13.43
3506.25	11.72	10.55	3568.75	14.65	12.84	3631.25	13.41	11.52	3693.75	14.39	12.79
3507.50	12.14	10.27	3570.00	15.00	13.19	3632.50	13.49	12.20	3695.00	14.05	12.88
3508.75	12.05	10.17	3571.25	15.18	14.09	3633.75	13.57	12.14	3696.25	13.91	13.11
3510.00	12.15	10.84	3572.50	15.12	13.39	3635.00	13.22	11.27	3697.50	14.06	12.60
3511.25	12.46	11.00	3573.75	14.89	13.30	3636.25	13.24	11.11	3698.75	14.31	13.08
3512.50	12.44	10.50	3575.00	14.98	12.92	3637.50	12.78	11.18	3700.00	14.57	13.08
3513.75	12.04	10.76	3576.25	14.25	12.67	3638.75	12.85	10.81	3701.25	14.35	13.05
3515.00	11.63	10.56	3577.50	13.94	12.27	3640.00	13.10	11.78	3702.50	14.19	12.81
3516.25	11.80	9.91	3578.75	13.82	12.19	3641.25	13.58	12.07	3703.75	14.07	12.78
3517.50	11.46	9.88	3580.00	13.54	12.02	3642.50	14.09	12.42	3705.00	13.93	12.40
3518.75	11.53	9.60	3581.25	13.84	11.73	3643.75	14.40	12.90	3706.25	13.67	11.54
3520.00	11.93	10.10	3582.50	13.29	11.55	3645.00	14.55	12.89	3707.50	13.17	12.00
3521.25	12.21	10.91	3583.75	13.35	11.26	3646.25	14.77	13.77	3708.75	13.34	11.35
3522.50	12.14	10.15	3585.00	13.05	11.31	3647.50	14.96	13.39	3710.00	14.01	11.92
3523.75	11.92	10.25	3586.25	12.82	11.09	3648.75	15.15	14.03	3711.25	14.02	12.43
3525.00	11.78	9.94	3587.50	12.80	10.46	3650.00	15.54	14.44	3712.50	14.01	12.85
3526.25	11.66	9.90	3588.75	12.23	10.72	3651.25	15.75	15.05	3713.75	14.66	13.16
3527.50	11.31	9.20	3590.00	12.24	9.87	3652.50	16.15	15.06	3715.00	14.83	13.92
3528.75	10.90	8.48	3591.25	12.04	10.43	3653.75	15.97	15.42	3716.25	15.40	14.42
3530.00	10.72	8.39	3592.50	12.26	10.70	3655.00	16.01	14.60	3717.50	15.80	14.57
3531.25	10.80	9.24	3593.75	12.14	10.39	3656.25	15.68	14.63	3718.75	15.98	14.69
3532.50	10.81	9.18	3595.00	12.47	10.87	3657.50	15.55	14.10	3720.00	16.08	15.46
3533.75	11.27	9.51	3596.25	12.40	10.32	3658.75	14.89	13.48	3721.25	16.29	14.87
3535.00	11.77	9.02	3597.50	12.49	10.65	3660.00	14.51	13.00	3722.50	16.06	15.19
3536.25	12.21	10.40	3598.75	12.03	10.95	3661.25	13.91	12.26	3723.75	16.26	15.03
3537.50	12.49	10.88	3600.00	12.13	10.48	3662.50	13.57	11.69	3725.00	16.06	14.60
3538.75	13.05	10.74	3601.25	12.57	10.66	3663.75	13.35	11.07	3726.25	15.80	14.83
3540.00	13.55	12.05	3602.50	12.68	11.16	3665.00	13.17	11.66	3727.50	15.32	14.47
3541.25	14.32	12.30	3603.75	13.15	11.61	3666.25	13.11	11.97	3728.75	14.96	14.04
3542.50	14.99	13.19	3605.00	13.54	11.49	3667.50	13.03	11.98	3730.00	14.79	13.79
3543.75	15.28	13.10	3606.25	13.77	12.05	3668.75	13.82	12.62	3731.25	14.69	13.56
3545.00	14.51	13.38	3607.50	14.06	12.32	3670.00	13.94	12.62	3732.50	14.35	13.06
3546.25	14.55	12.73	3608.75	14.28	12.49	3671.25	14.60	13.27	3733.75	14.37	13.13
3547.50	14.48	13.27	3610.00	14.48	12.25	3672.50	14.99	13.64	3735.00	14.06	12.88
3548.75	14.14	12.44	3611.25	14.36	12.53	3673.75	14.89	13.96	3736.25	14.54	12.77
3550.00	13.79	11.74	3612.50	13.74	12.50	3675.00	14.67	13.58	3737.50	14.58	13.23
3551.25	13.43	11.62	3613.75	13.80	12.11	3676.25	14.47	13.36	3738.75	14.68	13.56
3552.50	13.11	10.92	3615.00	13.75	11.44	3677.50	14.85	13.44	3740.00	14.41	13.35
3553.75	12.75	10.74	3616.25	13.73	11.92	3678.75	14.65	13.67	3741.25	14.46	13.28
3555.00	12.59	10.85	3617.50	13.48	11.34	3680.00	14.36	13.42	3742.50	13.93	12.83
3556.25	12.41	10.47	3618.75	13.31	11.47	3681.25	14.45	13.38	3743.75	13.85	12.15
3557.50	12.34	10.36	3620.00	13.55	12.07	3682.50	14.40	12.73	3745.00	13.68	12.10
3558.75	12.24	10.49	3621.25	13.50	11.22	3683.75	14.16	12.58	3746.25	13.65	11.92
3560.00	12.38	10.41	3622.50	13.69	12.13	3685.00	14.16	13.06	3747.50	13.61	12.34
3561.25	12.43	10.33	3623.75	13.86	12.14	3686.25	13.87	12.45	3748.75	14.11	12.62

Table II. NO2 BASS ET AL. DATA AT 235K, 298K

WAVLGTH (A)	ABSOR.COEFF. (CM-1 ATM-1) 235K	298K	WAVLGTH (A)	ABSOR.COEFF. (CM-1 ATM-1) 235K	298K	WAVLGTH (A)	ABSOR.COEFF. (CM-1 ATM-1) 235K	298K	WAVLGTH (A)	ABSOR.COEFF. (CM-1 ATM-1) 235K	298K
3750.00	14.39	13.43	3812.50	15.36	14.67	3875.00	15.69	15.62	3937.50	14.53	14.43
3751.25	14.91	14.27	3813.75	15.63	15.25	3876.25	16.08	15.96	3938.75	14.78	14.05
3752.50	15.32	13.92	3815.00	14.83	14.73	3877.50	15.91	15.65	3940.00	14.50	14.49
3753.75	15.78	14.48	3816.25	14.91	14.76	3878.75	16.24	16.09	3941.25	14.53	13.69
3755.00	15.86	14.64	3817.50	15.08	15.24	3880.00	16.07	14.98	3942.50	14.26	13.30
3756.25	15.85	14.35	3818.75	15.10	14.58	3881.25	15.49	15.31	3943.75	14.31	13.61
3757.50	15.99	14.78	3820.00	15.15	14.99	3882.50	15.60	14.57	3945.00	14.07	13.15
3758.75	15.99	14.79	3821.25	15.52	14.81	3883.75	15.30	14.76	3946.25	13.91	12.83
3760.00	16.76	15.70	3822.50	14.73	13.77	3885.00	15.29	14.51	3947.50	15.00	13.89
3761.25	17.48	16.52	3823.75	13.83	13.70	3886.25	15.24	14.91	3948.75	15.62	14.13
3762.50	17.57	16.51	3825.00	14.16	13.56	3887.50	15.53	14.45	3950.00	15.83	15.10
3763.75	17.34	16.24	3826.25	14.22	13.96	3888.75	16.11	15.45	3951.25	15.83	14.93
3765.00	16.93	16.05	3827.50	14.30	13.65	3890.00	16.19	16.01	3952.50	16.27	15.93
3766.25	16.65	15.62	3828.75	14.70	14.94	3891.25	16.66	16.08	3953.75	17.46	15.94
3767.50	16.33	15.47	3830.00	14.44	14.45	3892.50	16.24	15.96	3955.00	16.70	15.62
3768.75	15.28	14.30	3831.25	14.39	13.98	3893.75	16.31	15.85	3956.25	17.21	16.42
3770.00	15.24	13.86	3832.50	14.83	14.80	3895.00	16.22	15.05	3957.50	17.25	16.58
3771.25	14.69	13.40	3833.75	14.62	14.10	3896.25	15.85	15.03	3958.75	17.07	16.61
3772.50	14.21	12.97	3835.00	14.50	13.91	3897.50	15.43	14.58	3960.00	16.52	16.03
3773.75	13.99	12.60	3836.25	15.27	13.72	3898.75	16.17	15.60	3961.25	15.92	15.44
3775.00	14.08	12.29	3837.50	15.72	14.60	3900.00	16.13	14.77	3962.50	16.05	14.89
3776.25	14.06	12.39	3838.75	15.23	14.96	3901.25	16.29	15.46	3963.75	15.10	14.48
3777.50	14.08	12.51	3840.00	16.04	15.17	3902.50	16.68	15.25	3965.00	15.03	14.02
3778.75	14.19	12.68	3841.25	15.16	14.48	3903.75	16.26	15.59	3966.25	14.91	13.09
3780.00	13.91	12.78	3842.50	15.78	14.80	3905.00	16.07	15.25	3967.50	14.53	13.71
3781.25	13.63	12.51	3843.75	15.89	15.71	3906.25	15.79	15.21	3968.75	14.53	13.93
3782.50	13.76	12.26	3845.00	15.96	15.70	3907.50	15.93	14.57	3970.00	15.23	13.51
3783.75	13.88	12.60	3846.25	16.28	15.51	3908.75	15.42	14.76	3971.25	14.29	13.34
3785.00	14.04	12.50	3847.50	17.18	16.21	3910.00	15.67	14.67	3972.50	14.43	13.89
3786.25	14.21	13.04	3848.75	16.58	16.91	3911.25	15.94	15.41	3973.75	14.07	13.17
3787.50	14.04	12.77	3850.00	15.97	15.55	3912.50	16.19	15.05	3975.00	14.88	14.46
3788.75	14.42	13.10	3851.25	15.28	14.91	3913.75	15.67	14.94	3976.25	15.97	15.27
3790.00	14.70	13.60	3852.50	15.68	14.86	3915.00	16.73	15.66	3977.50	16.66	16.13
3791.25	14.96	13.81	3853.75	15.97	15.30	3916.25	17.60	16.79	3978.75	17.32	17.31
3792.50	15.31	14.71	3855.00	15.60	15.07	3917.50	18.49	17.50	3980.00	17.62	17.33
3793.75	15.84	15.00	3856.25	16.87	16.03	3918.75	17.17	17.14	3981.25	17.97	17.71
3795.00	16.53	15.60	3857.50	16.40	15.90	3920.00	16.26	15.83	3982.50	18.39	17.13
3796.25	17.00	16.22	3858.75	15.36	14.96	3921.25	16.14	15.16	3983.75	16.60	17.99
3797.50	16.90	16.15	3860.00	14.80	14.90	3922.50	16.51	15.48	3985.00	17.67	16.56
3798.75	16.82	15.81	3861.25	14.98	14.46	3923.75	16.16	14.95	3986.25	17.27	16.39
3800.00	16.09	15.93	3862.50	15.03	14.06	3925.00	16.68	15.53	3987.50	15.94	15.39
3801.25	16.25	15.64	3863.75	14.43	13.49	3926.25	16.22	14.79	3988.75	15.20	14.23
3802.50	15.99	15.38	3865.00	14.30	13.74	3927.50	16.13	15.06	3990.00	15.15	13.66
3803.75	15.96	16.29	3866.25	14.66	14.13	3928.75	15.64	14.96	3991.25	14.83	14.27
3805.00	15.73	15.97	3867.50	15.11	13.76	3930.00	14.66	13.66	3992.50	14.68	13.17
3806.25	15.97	16.38	3868.75	15.16	14.75	3931.25	14.47	13.53	3993.75	15.41	13.25
3807.50	15.37	15.17	3870.00	15.06	15.00	3932.50	13.98	12.81	3995.00	16.05	14.44
3808.75	15.13	14.67	3871.25	15.98	15.36	3933.75	14.57	13.79	3996.25	15.92	15.45
3810.00	15.22	14.49	3872.50	15.58	15.58	3935.00	14.76	13.72	3997.50	17.30	15.85
3811.25	15.43	14.79	3873.75	16.22	15.54	3936.25	15.04	14.33	3998.75	18.09	17.51

Table II. NO2 BASS ET AL. DATA AT 235K, 298K

WAVLGTH (A)	ABSOR.COEFF. (CM-1 ATM-1) 235K	298K	WAVLGTH (A)	ABSOR.COEFF. (CM-1 ATM-1) 235K	298K
4000.00	18.17	17.91	4052.50	16.44	17.32
4001.25	17.89	17.91	4053.75	16.42	16.25
4002.50	17.27	16.78	4055.00	15.88	14.35
4003.75	17.98	17.08	4056.25	14.50	13.05
4005.00	17.61	16.01	4057.50	14.72	13.33
4006.25	17.21	16.43	4058.75	15.44	13.83
4007.50	17.51	16.31	4060.00	14.49	13.25
4008.75	17.44	16.66	4061.25	15.30	14.01
4010.00	17.54	16.92	4062.50	14.93	13.63
4011.25	17.02	15.86	4063.75	13.42	11.96
4012.50	16.92	15.24	4065.00	13.62	12.46
4013.75	16.87	15.92	4066.25	12.87	11.96
4015.00	16.64	14.97	4067.50	13.17	11.87
4016.25	16.15	15.23	4068.75	12.69	11.66
4017.50	16.53	15.13	4070.00	12.71	11.62
4018.75	15.56	14.85	4071.25	12.60	11.46
4020.00	15.35	14.52	4072.50	13.09	11.78
4021.25	14.69	13.02	4073.75	13.42	11.91
4022.50	14.55	13.49	4075.00	13.69	12.23
4023.75	14.71	13.64	4076.25	15.06	14.05
4025.00	14.31	12.83	4077.50	15.86	17.06
4026.25	13.66	12.77	4078.75	16.68	15.77
4027.50	14.02	13.16	4080.00	16.33	14.65
4028.75	13.91	13.07	4081.25	17.93	16.15
4030.00	13.72	12.85	4082.50	16.42	17.77
4031.25	14.17	12.63	4083.75	14.71	17.98
4032.50	13.85	12.58	4085.00	16.41	16.73
4033.75	14.31	13.62	4086.25	17.49	16.21
4035.00	14.26	13.28	4087.50	16.47	16.31
4036.25	15.02	13.42	4088.75	16.86	15.13
4037.50	15.98	15.11	4090.00	15.66	13.82
4038.75	16.54	15.48	4091.25	15.37	14.05
4040.00	16.31	15.15	4092.50	15.86	15.52
4041.25	15.64	14.74	4093.75	16.54	15.15
4042.50	15.28	13.87	4095.00	17.27	15.47
4043.75	15.40	13.80	4096.25	15.76	14.67
4045.00	14.78	13.33	4097.50	15.41	13.72
4046.25	15.40	14.41	4098.75	15.17	13.44
4047.50	17.60	16.29	4100.00	15.52	14.31
4048.75	15.95	15.34	4101.25	17.96	15.92
4050.00	16.99	16.02	4102.50	16.06	17.75
4051.25	16.17	17.67			

Table III. NO2 WILKERSON ET AL. DATA AT 273K

WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)
3801.4	1.4000E+01	3869.5	1.2190E+01	3937.7	1.2095E+01	4005.9	1.5048E+01
3802.7	1.4095E+01	3870.9	1.2190E+01	3939.1	1.2286E+01	4007.3	1.4952E+01
3804.1	1.4095E+01	3872.3	1.2476E+01	3940.5	1.2476E+01	4008.6	1.4810E+01
3805.5	1.3857E+01	3873.6	1.2762E+01	3941.8	1.2524E+01	4010.0	1.4762E+01
3806.8	1.3667E+01	3875.0	1.3000E+01	3943.2	1.2476E+01	4011.4	1.4619E+01
3808.2	1.3571E+01	3876.4	1.3143E+01	3944.5	1.2381E+01	4012.7	1.4524E+01
3809.5	1.3571E+01	3877.7	1.3238E+01	3945.9	1.2333E+01	4014.1	1.4524E+01
3810.9	1.3571E+01	3879.1	1.3333E+01	3947.3	1.2190E+01	4015.5	1.4476E+01
3812.3	1.3524E+01	3880.5	1.3333E+01	3948.6	1.2143E+01	4016.8	1.4286E+01
3813.6	1.3333E+01	3881.8	1.3381E+01	3950.0	1.2143E+01	4018.2	1.4095E+01
3815.0	1.3143E+01	3883.2	1.3429E+01	3951.4	1.2238E+01	4019.5	1.3810E+01
3816.4	1.3000E+01	3884.5	1.3333E+01	3952.7	1.2381E+01	4020.9	1.3619E+01
3817.7	1.2952E+01	3885.9	1.3143E+01	3954.1	1.2857E+01	4022.3	1.3429E+01
3819.1	1.2905E+01	3887.3	1.3048E+01	3955.5	1.3048E+01	4023.6	1.3143E+01
3820.5	1.2905E+01	3888.6	1.2952E+01	3956.8	1.3333E+01	4025.0	1.2857E+01
3821.8	1.2952E+01	3890.0	1.2952E+01	3958.2	1.4095E+01	4026.4	1.2571E+01
3823.2	1.2905E+01	3891.4	1.3048E+01	3959.5	1.4190E+01	4027.7	1.2381E+01
3824.5	1.2857E+01	3892.7	1.3286E+01	3960.9	1.4095E+01	4029.1	1.2238E+01
3825.9	1.2857E+01	3894.1	1.3571E+01	3962.3	1.4190E+01	4030.5	1.2048E+01
3827.3	1.2762E+01	3895.5	1.3810E+01	3963.6	1.4286E+01	4031.8	1.1952E+01
3828.6	1.2381E+01	3896.8	1.3905E+01	3965.0	1.3905E+01	4033.2	1.2000E+01
3830.0	1.2000E+01	3898.2	1.3714E+01	3966.4	1.3429E+01	4034.5	1.2048E+01
3831.4	1.2048E+01	3899.5	1.3524E+01	3967.7	1.3143E+01	4035.9	1.1952E+01
3832.7	1.2143E+01	3900.9	1.3238E+01	3969.1	1.2762E+01	4037.3	1.1905E+01
3834.1	1.2190E+01	3902.3	1.3286E+01	3970.5	1.2476E+01	4038.6	1.2000E+01
3835.5	1.2190E+01	3903.6	1.3429E+01	3971.8	1.2381E+01	4040.0	1.2190E+01
3836.8	1.2381E+01	3905.0	1.3476E+01	3973.2	1.2381E+01	4041.4	1.2381E+01
3838.2	1.2619E+01	3906.4	1.3524E+01	3974.5	1.2381E+01	4042.7	1.2762E+01
3839.5	1.2619E+01	3907.7	1.3667E+01	3975.9	1.2381E+01	4044.1	1.3429E+01
3840.9	1.2667E+01	3909.1	1.3476E+01	3977.3	1.2381E+01	4045.5	1.3714E+01
3842.3	1.2952E+01	3910.5	1.3238E+01	3978.6	1.2286E+01	4046.8	1.3476E+01
3843.6	1.3143E+01	3911.8	1.3190E+01	3980.0	1.2381E+01	4048.2	1.3238E+01
3845.0	1.3238E+01	3913.2	1.3190E+01	3981.4	1.2857E+01	4049.5	1.3048E+01
3846.4	1.3048E+01	3914.5	1.3190E+01	3982.7	1.3333E+01	4050.9	1.2952E+01
3847.7	1.3095E+01	3915.9	1.3286E+01	3984.1	1.4286E+01	4052.3	1.3143E+01
3849.1	1.3333E+01	3917.3	1.3333E+01	3985.5	1.4476E+01	4053.6	1.3905E+01
3850.5	1.3619E+01	3918.6	1.3333E+01	3986.8	1.4762E+01	4055.0	1.4190E+01
3851.8	1.3810E+01	3920.0	1.3905E+01	3988.2	1.4952E+01	4056.4	1.4286E+01
3853.2	1.3857E+01	3921.4	1.4524E+01	3989.5	1.5143E+01	4057.7	1.4952E+01
3854.5	1.3667E+01	3922.7	1.4762E+01	3990.9	1.4762E+01	4059.1	1.4286E+01
3855.9	1.3333E+01	3924.1	1.4381E+01	3992.3	1.4286E+01	4060.5	1.3333E+01
3857.3	1.3095E+01	3925.5	1.3810E+01	3993.6	1.3333E+01	4061.8	1.2857E+01
3858.6	1.3143E+01	3926.8	1.3524E+01	3995.0	1.2952E+01	4063.2	1.2476E+01
3860.0	1.3143E+01	3928.2	1.3524E+01	3996.4	1.2571E+01	4064.5	1.2476E+01
3861.4	1.3333E+01	3929.5	1.3524E+01	3997.7	1.2571E+01	4065.9	1.2571E+01
3862.7	1.3571E+01	3930.9	1.3476E+01	3999.1	1.2667E+01	4067.3	1.2619E+01
3864.1	1.3143E+01	3932.3	1.3333E+01	4000.5	1.3238E+01	4068.6	1.2381E+01
3865.5	1.2857E+01	3933.6	1.3048E+01	4001.8	1.3524E+01	4070.0	1.1810E+01
3866.8	1.2524E+01	3935.0	1.2476E+01	4003.2	1.4095E+01	4071.4	1.1429E+01
3868.2	1.2286E+01	3936.4	1.2095E+01	4004.5	1.4762E+01	4072.7	1.1048E+01

Table III. NO2 WILKERSON ET AL. DATA AT 273K

WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)
4074.1	1.1048E+01	4142.3	1.5238E+01	4210.5	1.3190E+01	4278.6	1.3143E+01
4075.5	1.1000E+01	4143.6	1.3905E+01	4211.8	1.3143E+01	4280.0	1.3333E+01
4076.8	1.1048E+01	4145.0	1.3048E+01	4213.2	1.3619E+01	4281.4	1.3000E+01
4078.2	1.1143E+01	4146.4	1.2476E+01	4214.5	1.3810E+01	4282.7	1.3333E+01
4079.5	1.1429E+01	4147.7	1.2286E+01	4215.9	1.3333E+01	4284.1	1.3333E+01
4080.9	1.1762E+01	4149.1	1.2381E+01	4217.3	1.2952E+01	4285.5	1.3571E+01
4082.3	1.2571E+01	4150.5	1.2857E+01	4218.6	1.2667E+01	4286.8	1.3333E+01
4083.6	1.3143E+01	4151.8	1.2952E+01	4220.0	1.2571E+01	4288.2	1.2952E+01
4085.0	1.3905E+01	4153.2	1.2952E+01	4221.4	1.2762E+01	4289.5	1.2571E+01
4086.4	1.4286E+01	4154.5	1.2952E+01	4222.7	1.3143E+01	4290.9	1.1905E+01
4087.7	1.5524E+01	4155.9	1.3048E+01	4224.1	1.3905E+01	4292.3	1.1429E+01
4089.1	1.5810E+01	4157.3	1.2476E+01	4225.5	1.4095E+01	4293.6	1.1429E+01
4090.5	1.5429E+01	4158.6	1.1905E+01	4226.8	1.3619E+01	4295.0	1.1286E+01
4091.8	1.4857E+01	4160.0	1.1333E+01	4228.2	1.3429E+01	4296.4	1.0571E+01
4093.2	1.4333E+01	4161.4	1.0952E+01	4229.5	1.3429E+01	4297.7	1.0190E+01
4094.5	1.4095E+01	4162.7	1.0857E+01	4230.9	1.3333E+01	4299.1	9.7143E+00
4095.9	1.3619E+01	4164.1	1.1000E+01	4232.3	1.3048E+01	4300.5	9.5238E+00
4097.3	1.3429E+01	4165.5	1.0952E+01	4233.6	1.2905E+01	4301.8	9.5238E+00
4098.6	1.3905E+01	4166.8	1.0905E+01	4235.0	1.2810E+01	4303.2	9.5714E+00
4100.0	1.4095E+01	4168.2	1.0952E+01	4236.4	1.2762E+01	4304.5	1.0000E+01
4101.4	1.3810E+01	4169.5	1.0952E+01	4237.7	1.3238E+01	4305.9	1.0762E+01
4102.7	1.3333E+01	4170.9	1.1048E+01	4239.1	1.3429E+01	4307.3	1.1619E+01
4104.1	1.3143E+01	4172.3	1.1048E+01	4240.5	1.3619E+01	4308.6	1.2571E+01
4105.5	1.3333E+01	4173.6	1.1048E+01	4241.8	1.3524E+01	4310.0	1.3190E+01
4106.8	1.4476E+01	4175.0	1.1429E+01	4243.2	1.3714E+01	4311.4	1.3190E+01
4108.2	1.5143E+01	4176.4	1.1905E+01	4244.5	1.3905E+01	4312.7	1.3333E+01
4109.5	1.5095E+01	4177.7	1.2286E+01	4245.9	1.4000E+01	4314.1	1.3619E+01
4110.9	1.4762E+01	4179.1	1.2095E+01	4247.3	1.3714E+01	4315.5	1.3333E+01
4112.3	1.4286E+01	4180.5	1.1905E+01	4248.6	1.4286E+01	4316.8	1.2857E+01
4113.6	1.4000E+01	4181.8	1.2000E+01	4250.0	1.4571E+01	4318.2	1.2857E+01
4115.0	1.3333E+01	4183.2	1.2381E+01	4251.4	1.4190E+01	4319.5	1.2714E+01
4116.4	1.2762E+01	4184.5	1.2381E+01	4252.7	1.3905E+01	4320.9	1.2381E+01
4117.7	1.2381E+01	4185.9	1.2381E+01	4254.1	1.3333E+01	4322.3	1.1810E+01
4119.1	1.1905E+01	4187.3	1.2667E+01	4255.5	1.2381E+01	4323.6	1.1429E+01
4120.5	1.1810E+01	4188.6	1.2714E+01	4256.8	1.1905E+01	4325.0	1.0952E+01
4121.8	1.1857E+01	4190.0	1.3048E+01	4258.2	1.1714E+01	4326.4	1.0476E+01
4123.2	1.1857E+01	4191.4	1.2857E+01	4259.5	1.1714E+01	4327.7	1.0190E+01
4124.5	1.1857E+01	4192.7	1.2286E+01	4260.9	1.1429E+01	4329.1	1.0000E+01
4125.9	1.1810E+01	4194.1	1.2000E+01	4262.3	1.0952E+01	4330.5	9.8095E+00
4127.3	1.1810E+01	4195.5	1.2000E+01	4263.6	1.0476E+01	4331.8	1.0286E+01
4128.6	1.1905E+01	4196.8	1.2381E+01	4265.0	1.0190E+01	4333.2	1.0571E+01
4130.0	1.2381E+01	4198.2	1.2952E+01	4266.4	1.0000E+01	4334.5	1.1143E+01
4131.4	1.3048E+01	4199.5	1.3190E+01	4267.7	1.0048E+01	4335.9	1.1524E+01
4132.7	1.3619E+01	4200.9	1.3333E+01	4269.1	1.0095E+01	4337.3	1.1905E+01
4134.1	1.4286E+01	4202.3	1.3524E+01	4270.5	1.0000E+01	4338.6	1.2381E+01
4135.5	1.5238E+01	4203.6	1.3333E+01	4271.8	9.9524E+00	4340.0	1.2571E+01
4136.8	1.5905E+01	4205.0	1.3048E+01	4273.2	1.0190E+01	4341.4	1.2857E+01
4138.2	1.6476E+01	4206.4	1.3000E+01	4274.5	1.0952E+01	4342.7	1.2810E+01
4139.5	1.6762E+01	4207.7	1.3333E+01	4275.9	1.2000E+01	4344.1	1.2619E+01
4140.9	1.6286E+01	4209.1	1.3333E+01	4277.3	1.2381E+01	4345.5	1.1905E+01

Table III. NO2 WILKERSON ET AL. DATA AT 273K

WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)
4346.8	1.1905E+01	4415.0	9.4286E+00	4483.2	1.3810E+01	4551.4	1.0095E+01
4348.2	1.2095E+01	4416.4	9.4762E+00	4484.5	1.4571E+01	4552.7	9.9048E+00
4349.5	1.2476E+01	4417.7	9.3333E+00	4485.9	1.5619E+01	4554.1	9.6667E+00
4350.9	1.3810E+01	4419.1	8.9524E+00	4487.3	1.5810E+01	4555.5	9.7143E+00
4352.3	1.4857E+01	4420.5	8.4762E+00	4488.6	1.5524E+01	4556.8	9.5238E+00
4353.6	1.5524E+01	4421.8	8.2381E+00	4490.0	1.4667E+01	4558.2	9.1429E+00
4355.0	1.5714E+01	4423.2	8.1905E+00	4491.4	1.2857E+01	4559.5	8.9524E+00
4356.4	1.5429E+01	4424.5	7.9048E+00	4492.7	1.1429E+01	4560.9	8.7619E+00
4357.7	1.4286E+01	4425.9	8.0000E+00	4494.1	1.1429E+01	4562.3	8.9524E+00
4359.1	1.3190E+01	4427.3	8.3810E+00	4495.5	1.1143E+01	4563.6	9.3333E+00
4360.5	1.3190E+01	4428.6	8.6667E+00	4496.8	1.0476E+01	4565.0	9.2857E+00
4361.8	1.3143E+01	4430.0	8.5714E+00	4498.2	1.0190E+01	4566.4	9.0476E+00
4363.2	1.2667E+01	4431.4	8.6667E+00	4499.5	1.0000E+01	4567.7	8.6667E+00
4364.5	1.2429E+01	4432.7	8.7619E+00	4500.9	9.5238E+00	4569.1	8.2857E+00
4365.9	1.2381E+01	4434.1	9.1429E+00	4502.3	9.2381E+00	4570.5	7.6190E+00
4367.3	1.1905E+01	4435.5	9.4286E+00	4503.6	8.6667E+00	4571.8	7.3333E+00
4368.6	1.1714E+01	4436.8	9.4286E+00	4505.0	8.7619E+00	4573.2	7.4286E+00
4370.0	1.1429E+01	4438.2	9.4286E+00	4506.4	9.3333E+00	4574.5	7.6190E+00
4371.4	1.1238E+01	4439.5	9.5238E+00	4507.7	9.7143E+00	4575.9	8.1905E+00
4372.7	1.0857E+01	4440.9	9.9048E+00	4509.1	9.9048E+00	4577.3	8.7619E+00
4374.1	1.0190E+01	4442.3	9.9048E+00	4510.5	9.9048E+00	4578.6	9.8095E+00
4375.5	9.5238E+00	4443.6	9.8571E+00	4511.8	9.9524E+00	4580.0	1.0524E+01
4376.8	9.3810E+00	4445.0	9.9048E+00	4513.2	9.7143E+00	4581.4	1.0571E+01
4378.2	9.2381E+00	4446.4	1.0381E+01	4514.5	9.5238E+00	4582.7	1.0762E+01
4379.5	9.0476E+00	4447.7	1.0952E+01	4515.9	9.4762E+00	4584.1	1.1048E+01
4380.9	8.9524E+00	4449.1	1.1810E+01	4517.3	9.3333E+00	4585.5	1.0952E+01
4382.3	8.9048E+00	4450.5	1.2286E+01	4518.6	9.1905E+00	4586.8	1.0381E+01
4383.6	8.7619E+00	4451.8	1.3333E+01	4520.0	8.9524E+00	4588.2	1.0143E+01
4385.0	8.6667E+00	4453.2	1.4286E+01	4521.4	9.0952E+00	4589.5	1.0381E+01
4386.4	8.7143E+00	4454.5	1.4571E+01	4522.7	9.6190E+00	4590.9	1.0000E+01
4387.7	9.0476E+00	4455.9	1.4095E+01	4524.1	1.0000E+01	4592.3	9.5238E+00
4389.1	1.0000E+01	4457.3	1.2857E+01	4525.5	1.0143E+01	4593.6	8.7619E+00
4390.5	1.1905E+01	4458.6	1.2286E+01	4526.8	9.8571E+00	4595.0	8.2857E+00
4391.8	1.3333E+01	4460.0	1.1619E+01	4528.2	9.7619E+00	4596.4	8.5714E+00
4393.2	1.4095E+01	4461.4	1.1429E+01	4529.5	1.0095E+01	4597.7	8.7619E+00
4394.5	1.4810E+01	4462.7	1.0952E+01	4530.9	1.0381E+01	4599.1	9.1429E+00
4395.9	1.4381E+01	4464.1	1.0667E+01	4532.3	1.0095E+01	4600.5	9.0952E+00
4397.3	1.4762E+01	4465.5	1.0476E+01	4533.6	9.5238E+00	4601.8	9.0952E+00
4398.6	1.5238E+01	4466.8	1.0381E+01	4535.0	9.2381E+00	4603.2	9.2381E+00
4400.0	1.4476E+01	4468.2	9.9048E+00	4536.4	9.5238E+00	4604.5	9.6190E+00
4401.4	1.4000E+01	4469.5	9.2381E+00	4537.7	9.9048E+00	4605.9	1.0000E+01
4402.7	1.2952E+01	4470.9	8.8571E+00	4539.1	9.9048E+00	4607.3	1.0381E+01
4404.1	1.2952E+01	4472.3	8.8571E+00	4540.5	9.5238E+00	4608.6	1.0762E+01
4405.5	1.2476E+01	4473.6	8.8571E+00	4541.8	8.7619E+00	4610.0	1.0857E+01
4406.8	1.1905E+01	4475.0	9.1429E+00	4543.2	8.3810E+00	4611.4	1.0190E+01
4408.2	1.0476E+01	4476.4	9.4286E+00	4544.5	8.1905E+00	4612.7	1.0000E+01
4409.5	9.6190E+00	4477.7	9.5238E+00	4545.9	8.0952E+00	4614.1	9.5238E+00
4410.9	9.5238E+00	4479.1	1.0476E+01	4547.3	8.0952E+00	4615.5	9.3333E+00
4412.3	9.5238E+00	4480.5	1.1429E+01	4548.6	8.4762E+00	4616.8	9.4286E+00
4413.6	9.4762E+00	4481.8	1.2857E+01	4550.0	9.5238E+00	4618.2	8.8571E+00

Table III. NO2 WILKERSON ET AL. DATA AT 273K

WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)
4619.5	8.6190E+00	4687.7	7.4286E+00	4755.9	9.4286E+00	4824.1	6.7619E+00
4620.9	8.2857E+00	4689.1	7.4762E+00	4757.3	9.2381E+00	4825.5	6.3810E+00
4622.3	8.0000E+00	4690.5	7.4286E+00	4758.6	8.9524E+00	4826.8	6.1905E+00
4623.6	8.0000E+00	4691.8	7.4286E+00	4760.0	8.0952E+00	4828.2	6.0952E+00
4625.0	8.1429E+00	4693.2	7.3810E+00	4761.4	7.8571E+00	4829.5	6.0952E+00
4626.4	8.1905E+00	4694.5	7.2381E+00	4762.7	7.9524E+00	4830.9	5.8571E+00
4627.7	8.2857E+00	4695.9	7.1905E+00	4764.1	7.7143E+00	4832.3	5.7143E+00
4629.1	8.6667E+00	4697.3	6.9524E+00	4765.5	7.6190E+00	4833.6	5.2381E+00
4630.5	9.3333E+00	4698.6	6.7619E+00	4766.8	7.6190E+00	4835.0	5.0476E+00
4631.8	1.0476E+01	4700.0	6.4762E+00	4768.2	7.1429E+00	4836.4	5.1429E+00
4633.2	1.2381E+01	4701.4	6.4762E+00	4769.5	7.2381E+00	4837.7	5.1905E+00
4634.5	1.2190E+01	4702.7	6.7619E+00	4770.9	7.2381E+00	4839.1	4.9524E+00
4635.9	1.1905E+01	4704.1	7.1429E+00	4772.3	7.0000E+00	4840.5	4.9524E+00
4637.3	1.2095E+01	4705.5	7.1429E+00	4773.6	6.9524E+00	4841.8	5.0476E+00
4638.6	1.2000E+01	4706.8	7.4286E+00	4775.0	6.8571E+00	4843.2	5.1429E+00
4640.0	1.1429E+01	4708.2	7.6190E+00	4776.4	6.8571E+00	4844.5	5.3810E+00
4641.4	1.0476E+01	4709.5	7.4286E+00	4777.7	6.8571E+00	4845.9	5.3810E+00
4642.7	9.9048E+00	4710.9	6.9524E+00	4779.1	6.9048E+00	4847.3	5.5238E+00
4644.1	9.6190E+00	4712.3	6.8095E+00	4780.5	7.0000E+00	4848.6	5.7619E+00
4645.5	9.2381E+00	4713.6	6.7619E+00	4781.8	6.8571E+00	4850.0	5.7619E+00
4646.8	9.3333E+00	4715.0	6.7143E+00	4783.2	6.9524E+00	4851.4	5.7619E+00
4648.2	9.4286E+00	4716.4	6.5714E+00	4784.5	7.0476E+00	4852.7	5.9048E+00
4649.5	9.0952E+00	4717.7	6.7143E+00	4785.9	6.7619E+00	4854.1	5.9048E+00
4650.9	8.7619E+00	4719.1	6.8571E+00	4787.3	6.6667E+00	4855.5	5.9048E+00
4652.3	8.4762E+00	4720.5	7.1429E+00	4788.6	6.6667E+00	4856.8	5.8095E+00
4653.6	8.1905E+00	4721.8	7.4762E+00	4790.0	6.7619E+00	4858.2	5.7143E+00
4655.0	7.8571E+00	4723.2	7.5238E+00	4791.4	6.9524E+00	4859.5	5.8095E+00
4656.4	7.5238E+00	4724.5	7.4286E+00	4792.7	7.1429E+00	4860.9	5.9048E+00
4657.7	6.9524E+00	4725.9	7.2857E+00	4794.1	7.1905E+00	4862.3	6.0000E+00
4659.1	6.4762E+00	4727.3	7.1429E+00	4795.5	7.4286E+00	4863.6	6.0952E+00
4660.5	6.2857E+00	4728.6	6.8571E+00	4796.8	7.8095E+00	4865.0	6.1905E+00
4661.8	6.1905E+00	4730.0	6.9524E+00	4798.2	8.5714E+00	4866.4	6.0952E+00
4663.2	6.2381E+00	4731.4	7.2381E+00	4799.5	8.7619E+00	4867.7	5.7619E+00
4664.5	6.4762E+00	4732.7	7.1905E+00	4800.9	8.9524E+00	4869.1	5.2857E+00
4665.9	6.6667E+00	4734.1	7.1905E+00	4802.3	9.0476E+00	4870.5	5.3810E+00
4667.3	7.3333E+00	4735.5	7.5238E+00	4803.6	8.5714E+00	4871.8	5.5238E+00
4668.6	7.9048E+00	4736.8	7.8095E+00	4805.0	8.0952E+00	4873.2	5.5238E+00
4670.0	8.5714E+00	4738.2	8.4762E+00	4806.4	7.5238E+00	4874.5	5.3810E+00
4671.4	9.0476E+00	4739.5	9.0476E+00	4807.7	7.5714E+00	4875.9	5.2381E+00
4672.7	9.5238E+00	4740.9	1.0095E+01	4809.1	7.5714E+00	4877.3	5.4286E+00
4674.1	9.7143E+00	4742.3	1.1143E+01	4810.5	7.5714E+00	4878.6	5.5714E+00
4675.5	9.3333E+00	4743.6	1.0857E+01	4811.8	7.2381E+00	4880.0	5.8095E+00
4676.8	9.0476E+00	4745.0	1.0476E+01	4813.2	7.1429E+00	4881.4	6.0952E+00
4678.2	8.7619E+00	4746.4	9.9048E+00	4814.5	7.2381E+00	4882.7	6.4762E+00
4679.5	8.7143E+00	4747.7	9.7143E+00	4815.9	7.6190E+00	4884.1	6.6667E+00
4680.9	8.6667E+00	4749.1	9.9048E+00	4817.3	8.0000E+00	4885.5	7.0476E+00
4682.3	8.9524E+00	4750.5	1.0095E+01	4818.6	7.9048E+00	4886.8	7.8095E+00
4683.6	9.0000E+00	4751.8	1.0381E+01	4820.0	7.5238E+00	4888.2	8.7619E+00
4685.0	8.7619E+00	4753.2	1.0000E+01	4821.4	7.2381E+00	4889.5	8.9524E+00
4686.4	8.0952E+00	4754.5	9.7143E+00	4822.7	7.0000E+00	4890.9	9.6190E+00

Table III. NO2 WILKERSON ET AL. DATA AT 273K

WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)
4892.3	1.0095E+01	4960.5	6.8571E+00	5028.6	5.4286E+00	5096.8	5.4286E+00
4893.6	9.6190E+00	4961.3	6.9048E+00	5030.0	5.6190E+00	5098.2	5.2857E+00
4895.0	8.8095E+00	4963.2	6.8095E+00	5031.4	5.9524E+00	5099.5	5.4286E+00
4896.4	8.3810E+00	4964.5	6.8095E+00	5032.7	6.2381E+00	5100.9	5.7143E+00
4897.7	8.4286E+00	4965.9	6.8571E+00	5034.1	6.0000E+00	5102.3	6.1905E+00
4899.1	8.0952E+00	4967.3	6.8571E+00	5035.5	5.2381E+00	5103.6	5.7143E+00
4900.5	7.7143E+00	4968.6	6.8571E+00	5036.8	5.0000E+00	5105.0	5.5238E+00
4901.8	7.5238E+00	4970.0	6.9048E+00	5038.2	4.8571E+00	5106.4	5.4286E+00
4903.2	7.0476E+00	4971.4	6.7619E+00	5039.5	4.5714E+00	5107.7	5.2857E+00
4904.5	6.6667E+00	4972.7	6.1905E+00	5040.9	4.5714E+00	5109.1	5.2381E+00
4905.9	6.8571E+00	4974.1	5.8095E+00	5042.3	4.6190E+00	5110.5	5.1429E+00
4907.3	6.6667E+00	4975.5	5.5238E+00	5043.6	4.7619E+00	5111.8	5.1905E+00
4908.6	6.2857E+00	4976.9	5.3333E+00	5045.0	5.3333E+00	5113.2	5.1905E+00
4910.0	5.9048E+00	4978.2	5.1429E+00	5046.4	5.9048E+00	5114.5	5.1429E+00
4911.4	5.6190E+00	4979.5	4.8571E+00	5047.7	6.2857E+00	5115.9	5.2381E+00
4912.7	5.4762E+00	4980.9	4.6667E+00	5049.1	6.4762E+00	5117.3	5.3333E+00
4914.1	5.2381E+00	4982.3	4.5714E+00	5050.5	7.0000E+00	5118.6	5.2857E+00
4915.5	4.9524E+00	4983.6	4.5714E+00	5051.8	7.5238E+00	5120.0	5.2381E+00
4916.8	4.7619E+00	4985.0	4.4762E+00	5053.2	7.0476E+00	5121.4	4.6190E+00
4918.2	4.8571E+00	4986.4	4.0952E+00	5054.5	6.4762E+00	5122.7	4.7619E+00
4919.5	4.8571E+00	4987.7	3.9524E+00	5055.9	6.4762E+00	5124.1	4.9524E+00
4920.9	5.1429E+00	4989.1	4.0000E+00	5057.3	6.0952E+00	5125.5	5.0952E+00
4922.3	5.3333E+00	4990.5	3.9524E+00	5058.6	5.7143E+00	5126.8	5.2381E+00
4923.6	5.7143E+00	4991.8	3.9048E+00	5060.0	5.2381E+00	5128.2	5.3333E+00
4925.0	5.6190E+00	4993.2	3.8095E+00	5061.4	5.0000E+00	5129.5	5.4286E+00
4926.4	5.4762E+00	4994.5	3.7143E+00	5062.7	4.7619E+00	5130.9	5.1429E+00
4927.7	5.2857E+00	4995.9	3.7143E+00	5064.1	4.7619E+00	5132.3	4.7619E+00
4929.1	5.1429E+00	4997.3	3.4286E+00	5065.5	4.8571E+00	5133.6	4.4762E+00
4930.5	5.2857E+00	4998.6	3.3333E+00	5066.8	5.0476E+00	5135.0	4.4286E+00
4931.8	5.3333E+00	5000.0	3.3810E+00	5068.2	5.0476E+00	5136.4	4.1905E+00
4933.2	5.3810E+00	5001.4	3.4286E+00	5069.5	4.8571E+00	5137.7	4.0000E+00
4934.5	5.7143E+00	5002.7	3.4286E+00	5070.9	4.7143E+00	5139.1	3.9524E+00
4935.9	5.9048E+00	5004.1	3.4286E+00	5072.3	4.6667E+00	5140.5	4.0000E+00
4937.3	6.1905E+00	5005.5	3.3333E+00	5073.6	4.6190E+00	5141.8	3.9524E+00
4938.6	6.2381E+00	5006.8	3.4286E+00	5075.0	4.2857E+00	5143.2	3.7143E+00
4940.0	6.2857E+00	5008.2	3.5238E+00	5076.4	4.2381E+00	5144.5	3.5238E+00
4941.4	6.2857E+00	5009.5	3.6190E+00	5077.7	4.0476E+00	5145.9	3.7143E+00
4942.7	6.1905E+00	5010.9	3.6667E+00	5079.1	4.0952E+00	5147.3	3.7143E+00
4944.1	6.5714E+00	5012.3	3.7143E+00	5080.5	4.0000E+00	5148.6	3.7143E+00
4945.5	6.7619E+00	5013.6	3.8095E+00	5081.8	3.9048E+00	5150.0	3.6190E+00
4946.8	6.9524E+00	5015.0	4.1905E+00	5083.2	4.1905E+00	5151.4	3.6190E+00
4948.2	7.3810E+00	5016.4	4.0952E+00	5084.5	4.2857E+00	5152.7	3.4286E+00
4949.5	7.4286E+00	5017.7	3.9048E+00	5085.9	4.3810E+00	5154.1	3.3333E+00
4950.9	7.4762E+00	5019.1	4.0000E+00	5087.3	4.3333E+00	5155.5	3.2857E+00
4952.3	7.4762E+00	5020.5	4.0952E+00	5088.6	4.7143E+00	5156.8	3.2381E+00
4953.6	6.9524E+00	5021.8	4.1905E+00	5090.0	5.0000E+00	5158.2	3.2381E+00
4955.0	6.7619E+00	5023.2	4.4286E+00	5091.4	4.7619E+00	5159.5	3.2857E+00
4956.4	6.6190E+00	5024.5	4.6667E+00	5092.7	4.7619E+00	5160.9	3.3333E+00
4957.7	6.4762E+00	5025.9	4.9524E+00	5094.1	5.2381E+00	5162.3	3.2857E+00
4959.1	6.8571E+00	5027.3	5.2381E+00	5095.5	5.5714E+00	5163.6	3.1429E+00

Table III. NO2 WILKEPSON ET AL. DATA AT 273K

WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)
5165.0	3.0952E+00
5166.4	3.1429E+00
5167.7	3.1905E+00
5169.1	3.1905E+00
5170.5	3.0476E+00
5171.8	2.8571E+00
5173.2	2.7143E+00
5174.5	2.6190E+00
5175.9	2.6667E+00
5177.3	2.8095E+00
5178.6	2.8571E+00
5180.0	2.8095E+00
5181.4	2.7143E+00
5182.7	2.8571E+00
5184.1	3.2381E+00
5185.5	3.3333E+00
5186.8	3.5238E+00
5188.2	3.9048E+00
5189.5	4.2857E+00
5190.9	4.2857E+00
5192.3	4.0952E+00
5193.6	3.7143E+00
5195.0	3.6667E+00
5196.4	3.9048E+00
5197.7	3.9524E+00
5199.1	3.9048E+00
5200.5	3.9048E+00
5201.8	3.8095E+00
5203.2	3.9524E+00
5204.5	4.0476E+00
5205.9	4.0476E+00
5207.3	3.9048E+00
5208.6	3.6190E+00
5210.0	3.5238E+00
5211.4	3.4762E+00
5212.7	3.4286E+00
5214.1	3.4286E+00
5215.5	3.3333E+00
5216.8	3.1905E+00

Table IV. NO2 GRAHAM AND JOHNSTON DATA AT 25C

WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)
1900.0	1.5076E+01	6.1200E-19	2400.0	2.2146E+00	8.9900E-20	2900.0	2.1579E+00	8.7600E-20
1910.0	1.3869E+01	5.6300E-19	2410.0	1.1480E+00	4.6600E-20	2910.0	2.3329E+00	9.4700E-20
1920.0	1.1874E+01	4.8200E-19	2420.0	1.5051E+00	6.1100E-20	2920.0	2.5127E+00	1.0200E-19
1930.0	1.0174E+01	4.1300E-19	2430.0	2.4634E+00	1.0000E-19	2930.0	2.5619E+00	1.0400E-19
1940.0	9.5580E+00	3.8800E-19	2440.0	1.2440E+00	5.0500E-20	2940.0	2.4437E+00	9.9200E-20
1950.0	8.9668E+00	3.6400E-19	2450.0	9.6612E-01	3.9300E-20	2950.0	2.6359E+00	1.0700E-19
1960.0	7.7844E+00	3.1600E-19	2460.0	8.6958E-01	3.5300E-20	2960.0	2.6359E+00	1.0700E-19
1970.0	7.9322E+00	3.2200E-19	2470.0	6.6019E-01	2.6800E-20	2970.0	3.0300E+00	1.2300E-19
1980.0	7.9076E+00	3.2100E-19	2480.0	4.0646E-01	1.6500E-20	2980.0	3.3502E+00	1.3600E-19
1990.0	7.5873E+00	3.0800E-19	2490.0	5.2224E-01	2.1200E-20	2990.0	3.2271E+00	1.3100E-19
2000.0	7.8583E+00	3.1900E-19	2500.0	8.4988E-01	3.4500E-20	3000.0	3.2763E+00	1.3300E-19
2010.0	8.7944E+00	3.5700E-19	2510.0	4.7051E-01	1.9100E-20	3010.0	3.2271E+00	1.3100E-19
2020.0	8.7205E+00	3.5400E-19	2520.0	3.6951E-01	1.5000E-20	3020.0	3.4486E+00	1.4000E-19
2030.0	8.4495E+00	3.4300E-19	2530.0	3.4488E-01	1.4000E-20	3030.0	3.8183E+00	1.5500E-19
2040.0	9.5334E+00	3.8700E-19	2540.0	3.4488E-01	1.4000E-20	3040.0	4.0154E+00	1.6300E-19
2050.0	1.0519E+01	4.2700E-19	2550.0	3.8183E-01	1.5500E-20	3050.0	4.0646E+00	1.6500E-19
2060.0	9.8783E+00	4.0100E-19	2560.0	3.9168E-01	1.5900E-20	3060.0	4.0400E+00	1.6400E-19
2070.0	9.7797E+00	3.9700E-19	2570.0	3.9661E-01	1.6100E-20	3070.0	4.2371E+00	1.7200E-19
2080.0	1.1159E+01	4.5300E-19	2580.0	4.0893E-01	1.6600E-20	3080.0	4.3602E+00	1.7700E-19
2090.0	1.2046E+01	4.8900E-19	2590.0	4.5819E-01	1.8600E-20	3090.0	4.5327E+00	1.8400E-19
2100.0	1.1135E+01	4.5200E-19	2600.0	4.5327E-01	1.8400E-20	3100.0	4.8529E+00	1.9700E-19
2110.0	1.0936E+01	4.4400E-19	2610.0	4.5327E-01	1.8400E-20	3110.0	4.8776E+00	1.9800E-19
2120.0	1.2391E+01	5.0300E-19	2620.0	4.9268E-01	2.0000E-20	3120.0	5.1485E+00	2.0900E-19
2130.0	1.3401E+01	5.4400E-19	2630.0	5.1239E-01	2.0800E-20	3130.0	5.3702E+00	2.1800E-19
2140.0	1.2268E+01	4.9800E-19	2640.0	5.5427E-01	2.2500E-20	3140.0	5.2224E+00	2.1200E-19
2150.0	1.1455E+01	4.6500E-19	2650.0	5.9861E-01	2.4300E-20	3150.0	5.5180E+00	2.2400E-19
2160.0	1.2440E+01	5.0500E-19	2660.0	6.1339E-01	2.4900E-20	3160.0	5.6412E+00	2.2900E-19
2170.0	1.3918E+01	5.6500E-19	2670.0	6.0107E-01	2.4400E-20	3170.0	5.7644E+00	2.3400E-19
2180.0	1.2804E+01	5.2300E-19	2680.0	6.5280E-01	2.6500E-20	3180.0	6.3310E+00	2.5700E-19
2190.0	1.1332E+01	4.6000E-19	2690.0	7.6858E-01	3.1200E-20	3190.0	6.2817E+00	2.5500E-19
2200.0	1.0790E+01	4.3800E-19	2700.0	8.1785E-01	3.3200E-20	3200.0	6.4295E+00	2.6100E-19
2210.0	1.2539E+01	5.0900E-19	2710.0	8.0061E-01	3.2500E-20	3210.0	6.6512E+00	2.7000E-19
2220.0	1.2958E+01	5.2600E-19	2720.0	8.0307E-01	3.2600E-20	3220.0	6.6266E+00	2.6900E-19
2230.0	1.0864E+01	4.4100E-19	2730.0	9.0900E-01	3.6900E-20	3230.0	7.0207E+00	2.8500E-19
2240.0	9.4595E+00	3.8400E-19	2740.0	1.0026E+00	4.0700E-20	3240.0	7.0454E+00	2.8600E-19
2250.0	9.1393E+00	3.7100E-19	2750.0	1.0346E+00	4.2000E-20	3250.0	7.2424E+00	2.9400E-19
2260.0	1.0346E+01	4.2000E-19	2760.0	1.0272E+00	4.1700E-20	3260.0	7.6858E+00	3.1200E-19
2270.0	1.0864E+01	4.4100E-19	2770.0	1.0814E+00	4.3900E-20	3270.0	7.7105E+00	3.1300E-19
2280.0	8.2278E+00	3.3400E-19	2780.0	1.1504E+00	4.6700E-20	3280.0	7.8629E+00	3.2300E-19
2290.0	7.1193E+00	2.8900E-19	2790.0	1.2662E+00	5.1400E-20	3290.0	7.9076E+00	3.2100E-19
2300.0	6.2078E+00	2.5200E-19	2800.0	1.4041E+00	5.7000E-20	3300.0	8.3263E+00	3.3800E-19
2310.0	7.3902E+00	3.0000E-19	2810.0	1.4239E+00	5.7800E-20	3310.0	8.2032E+00	3.3300E-19
2320.0	7.3656E+00	2.9900E-19	2820.0	1.4760E+00	6.0000E-20	3320.0	8.3515E+00	3.3900E-19
2330.0	6.4788E+00	2.6300E-19	2830.0	1.7047E+00	6.9200E-20	3330.0	9.3117E+00	3.7800E-19
2340.0	3.9907E+00	1.6200E-19	2840.0	1.6209E+00	6.5800E-20	3340.0	9.0654E+00	3.6800E-19
2350.0	3.3502E+00	1.3600E-19	2850.0	1.7687E+00	7.1800E-20	3350.0	8.8929E+00	3.6100E-19
2360.0	4.2617E+00	1.7300E-19	2860.0	1.8944E+00	7.6900E-20	3360.0	9.1639E+00	3.7200E-19
2370.0	3.9168E+00	1.5900E-19	2870.0	1.9042E+00	7.7300E-20	3370.0	9.3363E+00	3.7900E-19
2380.0	3.9168E+00	1.5900E-19	2880.0	1.9091E+00	7.7500E-20	3380.0	9.1146E+00	3.7000E-19
2390.0	2.5127E+00	1.0200E-19	2890.0	1.9978E+00	8.1100E-20	3390.0	1.0272E+01	4.1700E-19

Table IV. NO2 GRAHAM AND JOHNSTON DATA AT 25C

WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)
3400.0	1.0272E+01	4.1700E-19	3900.0	1.6037E+01	6.5100E-19	4040.0	1.5524E+01	6.3020E-19
3410.0	1.0543E+01	4.2800E-19	3910.0	1.5864E+01	6.4400E-19	4041.0	1.5914E+01	6.4600E-19
3420.0	1.0839E+01	4.4000E-19	3920.0	1.6529E+01	6.7100E-19	4042.0	1.6002E+01	6.4960E-19
3430.0	9.6044E+00	3.9800E-19	3930.0	1.5544E+01	6.3100E-19	4043.0	1.5835E+01	6.4280E-19
3440.0	1.0149E+01	4.1200E-19	3940.0	1.4657E+01	5.9500E-19	4044.0	1.5603E+01	6.3340E-19
3450.0	1.0593E+01	4.3000E-19	3950.0	1.4978E+01	6.0800E-19	4045.0	1.5359E+01	6.2350E-19
3460.0	1.1011E+01	4.4700E-19	3960.0	1.6209E+01	6.5800E-19	4046.0	1.5194E+01	6.1680E-19
3470.0	1.1627E+01	4.7200E-19	3970.0	1.4854E+01	6.0300E-19	4047.0	1.5037E+01	6.1040E-19
3480.0	1.1800E+01	4.7900E-19	3980.0	1.5988E+01	6.4900E-19	4048.0	1.4911E+01	6.0530E-19
3490.0	1.2687E+01	5.1500E-19	3990.0	1.6283E+01	6.6100E-19	4049.0	1.5293E+01	6.2080E-19
3500.0	1.1036E+01	4.4800E-19	4000.0	1.6756E+01	6.8020E-19	4050.0	1.6098E+01	6.5350E-19
3510.0	1.1603E+01	4.7100E-19	4001.0	1.6825E+01	6.8300E-19	4051.0	1.6507E+01	6.7010E-19
3520.0	1.1652E+01	4.7300E-19	4002.0	1.7165E+01	6.9680E-19	4052.0	1.6194E+01	6.5740E-19
3530.0	1.1209E+01	4.5500E-19	4003.0	1.7535E+01	7.1180E-19	4053.0	1.6586E+01	6.7330E-19
3540.0	1.1997E+01	4.8700E-19	4004.0	1.7596E+01	7.1430E-19	4054.0	1.7409E+01	7.0670E-19
3550.0	1.3623E+01	5.5300E-19	4005.0	1.7448E+01	7.0830E-19	4055.0	1.7569E+01	7.1320E-19
3560.0	1.2317E+01	5.0000E-19	4006.0	1.7190E+01	6.9780E-19	4056.0	1.6862E+01	6.8440E-19
3570.0	1.3302E+01	5.4000E-19	4007.0	1.7278E+01	7.0140E-19	4057.0	1.6123E+01	6.5450E-19
3580.0	1.3894E+01	5.6400E-19	4008.0	1.7208E+01	6.9820E-19	4058.0	1.5510E+01	6.2960E-19
3590.0	1.2563E+01	5.1000E-19	4009.0	1.6914E+01	6.8660E-19	4059.0	1.4963E+01	6.0740E-19
3600.0	1.2219E+01	4.9600E-19	4010.0	1.6867E+01	6.8470E-19	4060.0	1.4539E+01	5.9020E-19
3610.0	1.3278E+01	5.3900E-19	4011.0	1.6911E+01	6.8650E-19	4061.0	1.4495E+01	5.8840E-19
3620.0	1.3426E+01	5.4500E-19	4012.0	1.6808E+01	6.8230E-19	4062.0	1.4566E+01	5.9130E-19
3630.0	1.3426E+01	5.4500E-19	4013.0	1.6884E+01	6.8540E-19	4063.0	1.4510E+01	5.8900E-19
3640.0	1.3229E+01	5.3700E-19	4014.0	1.6815E+01	6.8260E-19	4064.0	1.4689E+01	5.9630E-19
3650.0	1.4386E+01	5.8400E-19	4015.0	1.6501E+01	6.7310E-19	4065.0	1.4788E+01	6.0030E-19
3660.0	1.4879E+01	6.0400E-19	4016.0	1.6377E+01	6.6480E-19	4066.0	1.4354E+01	5.8270E-19
3670.0	1.3596E+01	5.5200E-19	4017.0	1.6190E+01	6.5720E-19	4067.0	1.3867E+01	5.6290E-19
3680.0	1.4263E+01	5.7900E-19	4018.0	1.6047E+01	6.5140E-19	4068.0	1.3504E+01	5.4820E-19
3690.0	1.3943E+01	5.6600E-19	4019.0	1.5874E+01	6.4440E-19	4069.0	1.3019E+01	5.2850E-19
3700.0	1.4041E+01	5.7000E-19	4020.0	1.5820E+01	6.4220E-19	4070.0	1.2891E+01	5.2330E-19
3710.0	1.3697E+01	5.5600E-19	4021.0	1.5601E+01	6.3330E-19	4071.0	1.2861E+01	5.2210E-19
3720.0	1.5002E+01	6.0900E-19	4022.0	1.5241E+01	6.1870E-19	4072.0	1.2810E+01	5.2000E-19
3730.0	1.5273E+01	6.2000E-19	4023.0	1.4933E+01	6.0620E-19	4073.0	1.2724E+01	5.1650E-19
3740.0	1.4312E+01	5.8100E-19	4024.0	1.4588E+01	5.9220E-19	4074.0	1.2797E+01	5.1950E-19
3750.0	1.4140E+01	5.7400E-19	4025.0	1.4431E+01	5.8580E-19	4075.0	1.2852E+01	5.2170E-19
3760.0	1.5766E+01	6.4000E-19	4026.0	1.4337E+01	5.8200E-19	4076.0	1.2985E+01	5.2710E-19
3770.0	1.5963E+01	6.4800E-19	4027.0	1.4162E+01	5.7490E-19	4077.0	1.3283E+01	5.3920E-19
3780.0	1.4115E+01	5.7300E-19	4028.0	1.3975E+01	5.6730E-19	4078.0	1.3699E+01	5.5610E-19
3790.0	1.4337E+01	5.8200E-19	4029.0	1.3862E+01	5.6270E-19	4079.0	1.4376E+01	5.8360E-19
3800.0	1.6061E+01	6.5200E-19	4030.0	1.4002E+01	5.6840E-19	4080.0	1.4881E+01	6.0410E-19
3810.0	1.5889E+01	6.4500E-19	4031.0	1.4115E+01	5.7300E-19	4081.0	1.5729E+01	6.3850E-19
3820.0	1.5224E+01	6.1800E-19	4032.0	1.4012E+01	5.6880E-19	4082.0	1.6061E+01	6.5200E-19
3830.0	1.4583E+01	5.9200E-19	4033.0	1.3815E+01	5.6080E-19	4083.0	1.6281E+01	6.6090E-19
3840.0	1.5224E+01	6.1800E-19	4034.0	1.3760E+01	5.5940E-19	4084.0	1.7308E+01	7.0260E-19
3850.0	1.5889E+01	6.4500E-19	4035.0	1.3857E+01	5.6250E-19	4085.0	1.8234E+01	7.4020E-19
3860.0	1.5446E+01	6.2700E-19	4036.0	1.4098E+01	5.7230E-19	4086.0	1.8503E+01	7.5110E-19
3870.0	1.5051E+01	6.1100E-19	4037.0	1.4231E+01	5.7770E-19	4087.0	1.8234E+01	7.4020E-19
3880.0	1.5741E+01	6.3900E-19	4038.0	1.4354E+01	5.8270E-19	4088.0	1.7695E+01	7.1830E-19
3890.0	1.5790E+01	6.4100E-19	4039.0	1.4079E+01	6.0400E-19	4089.0	1.7101E+01	6.9420E-19

Table IV. NO2 GRAHAM AND JOHNSTON DATA AT 25C

WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)
4090.0	1.6692E+01	6.7760E-19	4140.0	1.7320E+01	7.0310E-19	4190.0	1.4029E+01	5.6950E-19
4091.0	1.6601E+01	6.7390E-19	4141.0	1.6121E+01	6.5440E-19	4191.0	1.3822E+01	5.6110E-19
4092.0	1.6251E+01	6.5970E-19	4142.0	1.5293E+01	6.2080E-19	4192.0	1.3686E+01	5.6370E-19
4093.0	1.5635E+01	6.3470E-19	4143.0	1.4655E+01	5.9490E-19	4193.0	1.4140E+01	5.7400E-19
4094.0	1.5603E+01	6.3340E-19	4144.0	1.4290E+01	5.8010E-19	4194.0	1.4867E+01	6.0350E-19
4095.0	1.6017E+01	6.5020E-19	4145.0	1.4115E+01	5.7300E-19	4195.0	1.5345E+01	6.2290E-19
4096.0	1.6382E+01	6.6500E-19	4146.0	1.4384E+01	5.8390E-19	4196.0	1.5268E+01	6.1960E-19
4097.0	1.6520E+01	6.7060E-19	4147.0	1.4800E+01	6.0080E-19	4197.0	1.5335E+01	6.2250E-19
4098.0	1.6451E+01	6.6780E-19	4148.0	1.5017E+01	6.0960E-19	4198.0	1.5709E+01	6.3770E-19
4099.0	1.5983E+01	6.4880E-19	4149.0	1.5056E+01	6.1120E-19	4199.0	1.5808E+01	6.4170E-19
4100.0	1.5374E+01	6.2410E-19	4150.0	1.5022E+01	6.0980E-19	4200.0	1.5837E+01	6.4290E-19
4101.0	1.5150E+01	6.1500E-19	4151.0	1.4982E+01	6.0820E-19	4201.0	1.5522E+01	6.3010E-19
4102.0	1.5241E+01	6.1870E-19	4152.0	1.5231E+01	6.1830E-19	4202.0	1.5093E+01	6.1270E-19
4103.0	1.5606E+01	6.3350E-19	4153.0	1.5374E+01	6.2410E-19	4203.0	1.5059E+01	6.1130E-19
4104.0	1.6463E+01	6.6830E-19	4154.0	1.5172E+01	6.1590E-19	4204.0	1.5490E+01	6.2880E-19
4105.0	1.7404E+01	7.0650E-19	4155.0	1.4598E+01	5.9260E-19	4205.0	1.5675E+01	6.3630E-19
4106.0	1.7648E+01	7.1640E-19	4156.0	1.4014E+01	5.6890E-19	4206.0	1.5564E+01	6.3180E-19
4107.0	1.7793E+01	7.2230E-19	4157.0	1.3492E+01	5.4770E-19	4207.0	1.5446E+01	6.2700E-19
4108.0	1.7520E+01	7.1120E-19	4158.0	1.2945E+01	5.2550E-19	4208.0	1.5239E+01	6.1860E-19
4109.0	1.6882E+01	6.8530E-19	4159.0	1.2600E+01	5.1150E-19	4209.0	1.5241E+01	6.1870E-19
4110.0	1.6672E+01	6.7680E-19	4160.0	1.2613E+01	5.1200E-19	4210.0	1.5850E+01	6.4340E-19
4111.0	1.6554E+01	6.7200E-19	4161.0	1.2874E+01	5.2260E-19	4211.0	1.6121E+01	6.5440E-19
4112.0	1.6059E+01	6.5190E-19	4162.0	1.2871E+01	5.2250E-19	4212.0	1.6027E+01	6.5060E-19
4113.0	1.5416E+01	6.2580E-19	4163.0	1.2645E+01	5.1330E-19	4213.0	1.5766E+01	6.4000E-19
4114.0	1.5085E+01	6.0910E-19	4164.0	1.2731E+01	5.1680E-19	4214.0	1.5313E+01	6.2160E-19
4115.0	1.4608E+01	5.9300E-19	4165.0	1.2871E+01	5.2250E-19	4215.0	1.4933E+01	6.0620E-19
4116.0	1.4229E+01	5.7760E-19	4166.0	1.2765E+01	5.1820E-19	4216.0	1.4665E+01	5.9530E-19
4117.0	1.3913E+01	5.6480E-19	4167.0	1.2733E+01	5.1690E-19	4217.0	1.4551E+01	5.9070E-19
4118.0	1.3650E+01	5.5410E-19	4168.0	1.2933E+01	5.2500E-19	4218.0	1.4748E+01	5.9870E-19
4119.0	1.3778E+01	5.5930E-19	4169.0	1.2982E+01	5.2700E-19	4219.0	1.4950E+01	6.0690E-19
4120.0	1.3891E+01	5.6390E-19	4170.0	1.2857E+01	5.2190E-19	4220.0	1.5561E+01	6.3170E-19
4121.0	1.3817E+01	5.6090E-19	4171.0	1.2874E+01	5.2260E-19	4221.0	1.6256E+01	6.5990E-19
4122.0	1.3812E+01	5.6070E-19	4172.0	1.3184E+01	5.3520E-19	4222.0	1.6510E+01	6.7020E-19
4123.0	1.3751E+01	5.5820E-19	4173.0	1.3596E+01	5.5190E-19	4223.0	1.6268E+01	6.6040E-19
4124.0	1.3716E+01	5.5680E-19	4174.0	1.4098E+01	5.7230E-19	4224.0	1.5790E+01	6.4100E-19
4125.0	1.3650E+01	5.5410E-19	4175.0	1.4381E+01	5.8380E-19	4225.0	1.5657E+01	6.3560E-19
4126.0	1.3985E+01	5.6770E-19	4176.0	1.4202E+01	5.7650E-19	4226.0	1.5751E+01	6.3940E-19
4127.0	1.4561E+01	5.9110E-19	4177.0	1.3894E+01	5.6400E-19	4227.0	1.5724E+01	6.3830E-19
4128.0	1.5251E+01	6.1910E-19	4178.0	1.3702E+01	5.5620E-19	4228.0	1.5453E+01	6.2730E-19
4129.0	1.5677E+01	6.3640E-19	4179.0	1.3977E+01	5.6740E-19	4229.0	1.5244E+01	6.1860E-19
4130.0	1.5899E+01	6.4540E-19	4180.0	1.4453E+01	5.8670E-19	4230.0	1.5135E+01	6.1440E-19
4131.0	1.6357E+01	6.6400E-19	4181.0	1.4507E+01	5.8890E-19	4231.0	1.5017E+01	6.0960E-19
4132.0	1.7286E+01	7.0170E-19	4182.0	1.4256E+01	5.7870E-19	4232.0	1.4820E+01	6.0160E-19
4133.0	1.7956E+01	7.2890E-19	4183.0	1.4569E+01	5.9140E-19	4233.0	1.4719E+01	5.9750E-19
4134.0	1.8291E+01	7.4250E-19	4184.0	1.4753E+01	5.9890E-19	4234.0	1.5239E+01	6.1860E-19
4135.0	1.9114E+01	7.7590E-19	4185.0	1.4682E+01	5.9600E-19	4235.0	1.5443E+01	6.2690E-19
4136.0	1.9564E+01	7.9420E-19	4186.0	1.4953E+01	6.0700E-19	4236.0	1.5749E+01	6.3930E-19
4137.0	1.9555E+01	7.9380E-19	4187.0	1.5263E+01	6.2040E-19	4237.0	1.5958E+01	6.4780E-19
4138.0	1.9173E+01	7.7830E-19	4188.0	1.5217E+01	6.1770E-19	4238.0	1.5763E+01	6.3990E-19
4139.0	1.8367E+01	7.4560E-19	4189.0	1.4625E+01	5.9370E-19	4239.0	1.5810E+01	6.4180E-19

Table IV. NO2 GRAHAM AND JOHNSTON DATA AT 25C

WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)
4240.0	1.6091E+01	6.5320E-19	4290.0	1.3438E+01	5.4550E-19	4340.0	1.5049E+01	6.1090E-19
4241.0	1.6113E+01	6.5410E-19	4291.0	1.3408E+01	5.4430E-19	4341.0	1.5123E+01	6.1390E-19
4242.0	1.6438E+01	6.6730E-19	4292.0	1.2999E+01	5.2770E-19	4342.0	1.4960E+01	6.0730E-19
4243.0	1.6231E+01	6.5890E-19	4293.0	1.2329E+01	5.0050E-19	4343.0	1.4436E+01	5.8610E-19
4244.0	1.5830E+01	6.4260E-19	4294.0	1.1957E+01	4.8540E-19	4344.0	1.3854E+01	5.6240E-19
4245.0	1.6273E+01	6.6060E-19	4295.0	1.1714E+01	4.7550E-19	4345.0	1.3793E+01	5.5990E-19
4246.0	1.6961E+01	6.8850E-19	4296.0	1.1374E+01	4.6170E-19	4346.0	1.3876E+01	5.6330E-19
4247.0	1.6995E+01	6.8990E-19	4297.0	1.1204E+01	4.5480E-19	4347.0	1.4014E+01	5.6890E-19
4248.0	1.6746E+01	6.7980E-19	4298.0	1.1159E+01	4.5300E-19	4348.0	1.4441E+01	5.8620E-19
4249.0	1.6478E+01	6.6890E-19	4299.0	1.1056E+01	4.4880E-19	4349.0	1.5579E+01	6.3240E-19
4250.0	1.6287E+01	6.5790E-19	4300.0	1.1036E+01	4.4800E-19	4350.0	1.7042E+01	6.9180E-19
4251.0	1.5559E+01	6.3160E-19	4301.0	1.1213E+01	4.5520E-19	4351.0	1.7690E+01	7.1810E-19
4252.0	1.4840E+01	6.0240E-19	4302.0	1.1711E+01	4.7540E-19	4352.0	1.8446E+01	7.4861E-19
4253.0	1.4359E+01	5.8290E-19	4303.0	1.2494E+01	5.0720E-19	4353.0	1.8370E+01	7.4570E-19
4254.0	1.4007E+01	5.6860E-19	4304.0	1.3034E+01	5.2910E-19	4354.0	1.8190E+01	7.3840E-19
4255.0	1.3628E+01	5.5320E-19	4305.0	1.3576E+01	5.5110E-19	4355.0	1.8017E+01	7.3140E-19
4256.0	1.3704E+01	5.5630E-19	4306.0	1.4561E+01	5.9110E-19	4356.0	1.6892E+01	6.8570E-19
4257.0	1.3820E+01	5.6100E-19	4307.0	1.5266E+01	6.1970E-19	4357.0	1.5837E+01	6.4290E-19
4258.0	1.3450E+01	5.4600E-19	4308.0	1.5446E+01	6.2700E-19	4358.0	1.5428E+01	6.2630E-19
4259.0	1.2948E+01	5.2560E-19	4309.0	1.5298E+01	6.2100E-19	4359.0	1.5512E+01	6.2970E-19
4260.0	1.2499E+01	5.0740E-19	4310.0	1.5502E+01	6.2930E-19	4360.0	1.5542E+01	6.3090E-19
4261.0	1.2231E+01	4.9650E-19	4311.0	1.5936E+01	6.4690E-19	4361.0	1.5128E+01	6.1410E-19
4262.0	1.1965E+01	4.8570E-19	4312.0	1.6005E+01	6.4970E-19	4362.0	1.4630E+01	5.9390E-19
4263.0	1.1600E+01	4.7090E-19	4313.0	1.5308E+01	6.2140E-19	4363.0	1.4643E+01	5.9440E-19
4264.0	1.1536E+01	4.6830E-19	4314.0	1.4990E+01	6.0850E-19	4364.0	1.4613E+01	5.9320E-19
4265.0	1.1718E+01	4.7570E-19	4315.0	1.5054E+01	6.1110E-19	4365.0	1.4182E+01	5.7570E-19
4266.0	1.1750E+01	4.7700E-19	4316.0	1.5017E+01	6.0960E-19	4366.0	1.4014E+01	5.6890E-19
4267.0	1.1645E+01	4.7270E-19	4317.0	1.4857E+01	6.0310E-19	4367.0	1.3822E+01	5.6110E-19
4268.0	1.1534E+01	4.6820E-19	4318.0	1.4679E+01	5.9590E-19	4368.0	1.3456E+01	5.4630E-19
4269.0	1.1386E+01	4.6220E-19	4319.0	1.4194E+01	5.7620E-19	4369.0	1.3315E+01	5.4050E-19
4270.0	1.1526E+01	4.6790E-19	4320.0	1.3751E+01	5.5820E-19	4370.0	1.3155E+01	5.3400E-19
4271.0	1.2236E+01	4.9670E-19	4321.0	1.3418E+01	5.4470E-19	4371.0	1.2701E+01	5.1560E-19
4272.0	1.3366E+01	5.4260E-19	4322.0	1.2896E+01	5.2350E-19	4372.0	1.2014E+01	4.8770E-19
4273.0	1.3972E+01	5.6720E-19	4323.0	1.2305E+01	4.9950E-19	4373.0	1.1445E+01	4.6460E-19
4274.0	1.4192E+01	5.7610E-19	4324.0	1.2009E+01	4.8750E-19	4374.0	1.1152E+01	4.5270E-19
4275.0	1.4958E+01	6.0720E-19	4325.0	1.1940E+01	4.8470E-19	4375.0	1.0952E+01	4.4460E-19
4276.0	1.5633E+01	6.3460E-19	4326.0	1.1627E+01	4.7200E-19	4376.0	1.0790E+01	4.3800E-19
4277.0	1.5463E+01	6.2770E-19	4327.0	1.1284E+01	4.5480E-19	4377.0	1.0543E+01	4.2800E-19
4278.0	1.5012E+01	6.0940E-19	4328.0	1.1381E+01	4.6200E-19	4378.0	1.0460E+01	4.2460E-19
4279.0	1.5303E+01	6.2120E-19	4329.0	1.1630E+01	4.7210E-19	4379.0	1.0470E+01	4.2500E-19
4280.0	1.5490E+01	6.2880E-19	4330.0	1.1815E+01	4.7960E-19	4380.0	1.0460E+01	4.2460E-19
4281.0	1.5480E+01	6.2840E-19	4331.0	1.2344E+01	5.0110E-19	4381.0	1.0211E+01	4.1450E-19
4282.0	1.5953E+01	6.4760E-19	4332.0	1.2807E+01	5.1990E-19	4382.0	1.0051E+01	4.0800E-19
4283.0	1.5818E+01	6.4210E-19	4333.0	1.3054E+01	5.2990E-19	4383.0	1.0130E+01	4.1120E-19
4284.0	1.5342E+01	6.2280E-19	4334.0	1.3322E+01	5.4083E-19	4384.0	1.0309E+01	4.1850E-19
4285.0	1.5125E+01	6.1400E-19	4335.0	1.3743E+01	5.5790E-19	4385.0	1.0669E+01	4.3310E-19
4286.0	1.5032E+01	6.1020E-19	4336.0	1.4219E+01	5.7720E-19	4386.0	1.1413E+01	4.6330E-19
4287.0	1.4446E+01	5.8650E-19	4337.0	1.4448E+01	5.8650E-19	4387.0	1.2965E+01	5.2630E-19
4288.0	1.3669E+01	5.5490E-19	4338.0	1.4601E+01	5.9270E-19	4388.0	1.4473E+01	5.8750E-19
4289.0	1.3406E+01	5.4420E-19	4339.0	1.4978E+01	6.0800E-19	4389.0	1.5423E+01	6.2610E-19

Table IV. NO2 GRAHAM AND JOHNSTON DATA AT 25C

WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)
4390.0	1.6027E+01	6.5060E-19	4440.0	1.1430E+01	4.6400E-19	4490.0	1.3593E+01	5.5180E-19
4391.0	1.7099E+01	6.9410E-19	4441.0	1.1514E+01	4.6740E-19	4491.0	1.2987E+01	5.2720E-19
4392.0	1.7510E+01	7.1080E-19	4442.0	1.2071E+01	4.9000E-19	4492.0	1.2361E+01	5.0180E-19
4393.0	1.6729E+01	6.7910E-19	4443.0	1.2652E+01	5.1360E-19	4493.0	1.2063E+01	4.8970E-19
4394.0	1.7037E+01	6.9160E-19	4444.0	1.3411E+01	5.4440E-19	4494.0	1.1972E+01	4.8600E-19
4395.0	1.7907E+01	7.2690E-19	4445.0	1.3766E+01	5.5880E-19	4495.0	1.1829E+01	4.8020E-19
4396.0	1.7875E+01	7.2560E-19	4446.0	1.3835E+01	5.6160E-19	4496.0	1.1297E+01	4.5860E-19
4397.0	1.7172E+01	6.9710E-19	4447.0	1.4813E+01	6.0130E-19	4497.0	1.0926E+01	4.4330E-19
4398.0	1.6411E+01	6.6620E-19	4448.0	1.6093E+01	6.5330E-19	4498.0	1.0726E+01	4.3540E-19
4399.0	1.5448E+01	6.2710E-19	4449.0	1.6695E+01	6.7770E-19	4499.0	1.0346E+01	4.2000E-19
4400.0	1.5204E+01	6.1720E-19	4450.0	1.7293E+01	7.0200E-19	4500.0	1.0115E+01	4.1060E-19
4401.0	1.5224E+01	6.1800E-19	4451.0	1.6953E+01	6.8820E-19	4501.0	1.0041E+01	4.0760E-19
4402.0	1.5123E+01	6.1390E-19	4452.0	1.6054E+01	6.5170E-19	4502.0	1.0233E+01	4.1540E-19
4403.0	1.4904E+01	6.0500E-19	4453.0	1.5431E+01	6.2640E-19	4503.0	1.0684E+01	4.3370E-19
4404.0	1.4049E+01	5.7030E-19	4454.0	1.4751E+01	5.9880E-19	4504.0	1.1204E+01	4.5480E-19
4405.0	1.2864E+01	5.2220E-19	4455.0	1.4049E+01	5.7030E-19	4505.0	1.1516E+01	4.6750E-19
4406.0	1.2046E+01	4.8900E-19	4456.0	1.3790E+01	5.5980E-19	4506.0	1.1686E+01	4.7440E-19
4407.0	1.1329E+01	4.5990E-19	4457.0	1.3583E+01	5.5140E-19	4507.0	1.1625E+01	4.7190E-19
4408.0	1.1191E+01	4.5430E-19	4458.0	1.3327E+01	5.4100E-19	4508.0	1.1684E+01	4.7430E-19
4409.0	1.1258E+01	4.5700E-19	4459.0	1.2967E+01	5.2640E-19	4509.0	1.1688E+01	4.8260E-19
4410.0	1.1011E+01	4.4700E-19	4460.0	1.2593E+01	5.1120E-19	4510.0	1.1608E+01	4.7120E-19
4411.0	1.0999E+01	4.4650E-19	4461.0	1.2398E+01	5.0330E-19	4511.0	1.1280E+01	4.5790E-19
4412.0	1.1093E+01	4.5030E-19	4462.0	1.2154E+01	4.9340E-19	4512.0	1.1233E+01	4.5600E-19
4413.0	1.1130E+01	4.5180E-19	4463.0	1.2243E+01	4.9700E-19	4513.0	1.1245E+01	4.5650E-19
4414.0	1.0903E+01	4.4260E-19	4464.0	1.2012E+01	4.8760E-19	4514.0	1.1053E+01	4.4870E-19
4415.0	1.0378E+01	4.2130E-19	4465.0	1.1228E+01	4.5580E-19	4515.0	1.1061E+01	4.4900E-19
4416.0	9.9817E+00	4.0520E-19	4466.0	1.0723E+01	4.3530E-19	4516.0	1.0787E+01	4.3790E-19
4417.0	9.6763E+00	3.9280E-19	4467.0	1.0455E+01	4.2440E-19	4517.0	1.0428E+01	4.2330E-19
4418.0	9.6196E+00	3.9050E-19	4468.0	1.0386E+01	4.2160E-19	4518.0	1.0536E+01	4.2770E-19
4419.0	9.6393E+00	3.9130E-19	4469.0	1.0282E+01	4.1740E-19	4519.0	1.1034E+01	4.4790E-19
4420.0	9.3487E+00	3.7950E-19	4470.0	1.0359E+01	4.2050E-19	4520.0	1.1386E+01	4.6220E-19
4421.0	9.0826E+00	3.6870E-19	4471.0	1.0630E+01	4.3150E-19	4521.0	1.1795E+01	4.7880E-19
4422.0	9.2969E+00	3.7740E-19	4472.0	1.0965E+01	4.4510E-19	4522.0	1.2051E+01	4.8920E-19
4423.0	9.9547E+00	4.0410E-19	4473.0	1.1083E+01	4.4990E-19	4523.0	1.1746E+01	4.7680E-19
4424.0	1.0179E+01	4.1320E-19	4474.0	1.1349E+01	4.6070E-19	4524.0	1.1433E+01	4.6410E-19
4425.0	9.9891E+00	4.0550E-19	4475.0	1.1876E+01	4.8210E-19	4525.0	1.1452E+01	4.6490E-19
4426.0	9.9817E+00	4.0520E-19	4476.0	1.2659E+01	5.1390E-19	4526.0	1.1790E+01	4.7860E-19
4427.0	1.0085E+01	4.0940E-19	4477.0	1.3793E+01	5.5990E-19	4527.0	1.2076E+01	4.9020E-19
4428.0	1.0184E+01	4.1340E-19	4478.0	1.4973E+01	6.0783E-19	4528.0	1.2150E+01	4.9320E-19
4429.0	1.0534E+01	4.2760E-19	4479.0	1.5736E+01	6.3880E-19	4529.0	1.1948E+01	4.8500E-19
4430.0	1.0920E+01	4.4330E-19	4480.0	1.6919E+01	6.8680E-19	4530.0	1.1346E+01	4.6060E-19
4431.0	1.1014E+01	4.4710E-19	4481.0	1.8256E+01	7.4110E-19	4531.0	1.0817E+01	4.3910E-19
4432.0	1.1009E+01	4.4690E-19	4482.0	1.8498E+01	7.5090E-19	4532.0	1.0827E+01	4.3950E-19
4433.0	1.0898E+01	4.4240E-19	4483.0	1.8409E+01	7.4730E-19	4533.0	1.1204E+01	4.5480E-19
4434.0	1.0920E+01	4.4330E-19	4484.0	1.8330E+01	7.4410E-19	4534.0	1.1622E+01	4.7180E-19
4435.0	1.1319E+01	4.5950E-19	4485.0	1.7441E+01	7.0800E-19	4535.0	1.1797E+01	4.7890E-19
4436.0	1.1598E+01	4.7080E-19	4486.0	1.6017E+01	6.5020E-19	4536.0	1.1578E+01	4.7000E-19
4437.0	1.1652E+01	4.7300E-19	4487.0	1.4571E+01	5.9150E-19	4537.0	1.1253E+01	4.5680E-19
4438.0	1.1674E+01	4.7390E-19	4488.0	1.3495E+01	5.4780E-19	4538.0	1.0637E+01	4.3180E-19
4439.0	1.1519E+01	4.6760E-19	4489.0	1.3453E+01	5.4610E-19	4539.0	1.0021E+01	4.0660E-19

Table IV. NO2 GRAHAM AND JOHNSTON DATA AT 25C

WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)
4540.0	9.7970E+00	3.9770E-19	4590.0	1.0893E+01	4.4220E-19	4640.0	1.1625E+01	4.7190E-19
4541.0	9.6319E+00	3.9100E-19	4591.0	1.0061E+01	4.0840E-19	4641.0	1.1598E+01	4.7080E-19
4542.0	9.4694E+00	3.8440E-19	4592.0	9.5186E+00	3.8640E-19	4642.0	1.1349E+01	4.6070E-19
4543.0	9.3708E+00	3.8040E-19	4593.0	9.7945E+00	3.9760E-19	4643.0	1.0871E+01	4.4130E-19
4544.0	9.4497E+00	3.8360E-19	4594.0	9.9990E+00	4.0590E-19	4644.0	1.0812E+01	4.3890E-19
4545.0	9.6467E+00	3.9160E-19	4595.0	1.0226E+01	4.1510E-19	4645.0	1.1115E+01	4.5120E-19
4546.0	1.0263E+01	4.1660E-19	4596.0	1.0704E+01	4.3450E-19	4646.0	1.1048E+01	4.4850E-19
4547.0	1.1287E+01	4.5820E-19	4597.0	1.0706E+01	4.3460E-19	4647.0	1.0780E+01	4.3760E-19
4548.0	1.1842E+01	4.8070E-19	4598.0	1.0723E+01	4.3530E-19	4648.0	1.0578E+01	4.2940E-19
4549.0	1.1787E+01	4.7850E-19	4599.0	1.0575E+01	4.2930E-19	4649.0	1.0297E+01	4.1800E-19
4550.0	1.1539E+01	4.6840E-19	4600.0	1.0696E+01	4.3420E-19	4650.0	9.9423E+00	4.0360E-19
4551.0	1.1329E+01	4.5990E-19	4601.0	1.1004E+01	4.4670E-19	4651.0	9.8463E+00	3.9970E-19
4552.0	1.1544E+01	4.6860E-19	4602.0	1.1233E+01	4.5600E-19	4652.0	9.6344E+00	3.9110E-19
4553.0	1.1430E+01	4.6400E-19	4603.0	1.1558E+01	4.6920E-19	4653.0	9.3043E+00	3.7770E-19
4554.0	1.1014E+01	4.4710E-19	4604.0	1.1775E+01	4.7800E-19	4654.0	9.0309E+00	3.6660E-19
4555.0	1.0822E+01	4.3930E-19	4605.0	1.2118E+01	4.9190E-19	4655.0	8.5653E+00	3.4770E-19
4556.0	1.0711E+01	4.3480E-19	4606.0	1.2721E+01	5.1640E-19	4656.0	8.0307E+00	3.2600E-19
4557.0	1.0381E+01	4.2140E-19	4607.0	1.2913E+01	5.2420E-19	4657.0	7.5799E+00	3.0770E-19
4558.0	1.0213E+01	4.1460E-19	4608.0	1.2243E+01	4.9700E-19	4658.0	7.3730E+00	2.9930E-19
4559.0	1.0346E+01	4.2000E-19	4609.0	1.1847E+01	4.8090E-19	4659.0	7.3188E+00	2.9710E-19
4560.0	1.0731E+01	4.3560E-19	4610.0	1.1844E+01	4.8080E-19	4660.0	7.1784E+00	2.9140E-19
4561.0	1.0947E+01	4.4440E-19	4611.0	1.1507E+01	4.6710E-19	4661.0	7.1682E+00	2.9180E-19
4562.0	1.1019E+01	4.4730E-19	4612.0	1.0925E+01	4.4350E-19	4662.0	7.3779E+00	2.9950E-19
4563.0	1.0915E+01	4.4310E-19	4613.0	1.1021E+01	4.4740E-19	4663.0	7.4223E+00	3.0130E-19
4564.0	1.0499E+01	4.2620E-19	4614.0	1.1218E+01	4.5540E-19	4664.0	7.7302E+00	3.1380E-19
4565.0	1.0132E+01	4.1130E-19	4615.0	1.0871E+01	4.4130E-19	4665.0	8.2992E+00	3.3690E-19
4566.0	9.8807E+00	4.0110E-19	4616.0	1.0543E+01	4.2800E-19	4666.0	8.6687E+00	3.5190E-19
4567.0	9.2550E+00	3.7570E-19	4617.0	1.0272E+01	4.1700E-19	4667.0	9.0900E+00	3.6900E-19
4568.0	8.6712E+00	3.5200E-19	4618.0	9.9965E+00	4.0580E-19	4668.0	9.8783E+00	4.0100E-19
4569.0	8.4766E+00	3.4410E-19	4619.0	9.6615E+00	3.9220E-19	4669.0	1.0378E+01	4.2130E-19
4570.0	8.5530E+00	3.4720E-19	4620.0	9.4053E+00	3.8180E-19	4670.0	1.0669E+01	4.3310E-19
4571.0	8.8042E+00	3.5740E-19	4621.0	9.2895E+00	3.7710E-19	4671.0	1.1354E+01	4.6090E-19
4572.0	9.1516E+00	3.7150E-19	4622.0	9.3708E+00	3.8040E-19	4672.0	1.1484E+01	4.6620E-19
4573.0	9.5457E+00	3.8750E-19	4623.0	9.4817E+00	3.8490E-19	4673.0	1.1100E+01	4.5060E-19
4574.0	1.0149E+01	4.1200E-19	4624.0	9.4866E+00	3.8510E-19	4674.0	1.0694E+01	4.3410E-19
4575.0	1.1056E+01	4.4880E-19	4625.0	9.5112E+00	3.8610E-19	4675.0	1.0327E+01	4.1920E-19
4576.0	1.1988E+01	4.8340E-19	4626.0	9.6541E+00	3.9190E-19	4676.0	1.0250E+01	4.1610E-19
4577.0	1.2347E+01	5.0120E-19	4627.0	1.0093E+01	4.0970E-19	4677.0	1.0265E+01	4.1670E-19
4578.0	1.2361E+01	5.0180E-19	4628.0	1.0809E+01	4.3880E-19	4678.0	9.9817E+00	4.0520E-19
4579.0	1.2418E+01	5.0410E-19	4629.0	1.1768E+01	4.7770E-19	4679.0	1.0275E+01	4.1710E-19
4580.0	1.2743E+01	5.1730E-19	4630.0	1.3401E+01	5.4400E-19	4680.0	1.0595E+01	4.3010E-19
4581.0	1.3049E+01	5.2970E-19	4631.0	1.4512E+01	5.8910E-19	4681.0	1.0612E+01	4.3080E-19
4582.0	1.3076E+01	5.3080E-19	4632.0	1.4273E+01	5.7940E-19	4682.0	1.0622E+01	4.3120E-19
4583.0	1.2324E+01	5.0030E-19	4633.0	1.3761E+01	5.5860E-19	4683.0	1.0149E+01	4.1200E-19
4584.0	1.1783E+01	4.7830E-19	4634.0	1.3987E+01	5.6780E-19	4684.0	9.3216E+00	3.7840E-19
4585.0	1.1982E+01	4.8640E-19	4635.0	1.4128E+01	5.7350E-19	4685.0	8.6712E+00	3.5200E-19
4586.0	1.2312E+01	4.9980E-19	4636.0	1.3955E+01	5.6650E-19	4686.0	8.7944E+00	3.5700E-19
4587.0	1.2137E+01	4.9270E-19	4637.0	1.3497E+01	5.4790E-19	4687.0	8.8018E+00	3.5730E-19
4588.0	1.1726E+01	4.7600E-19	4638.0	1.2751E+01	5.1760E-19	4688.0	8.6392E+00	3.5070E-19
4589.0	1.1447E+01	4.6470E-19	4639.0	1.2024E+01	4.8813E-19	4689.0	8.7106E+00	3.5360E-19

Table IV. NO2 GRAHAM AND JOHNSTON DATA AT 25C

WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)
4690.0	8.7180E+00	3.5390E-19	4740.0	1.3137E+01	5.3330E-19	4790.0	8.2647E+00	3.3550E-19
4691.0	8.5505E+00	3.4710E-19	4741.0	1.2837E+01	5.2110E-19	4791.0	8.3387E+00	3.3850E-19
4692.0	8.5333E+00	3.4640E-19	4742.0	1.2551E+01	5.0950E-19	4792.0	8.4865E+00	3.4450E-19
4693.0	8.4766E+00	3.4410E-19	4743.0	1.2194E+01	4.9500E-19	4793.0	8.6737E+00	3.5210E-19
4694.0	8.2623E+00	3.3540E-19	4744.0	1.1741E+01	4.7660E-19	4794.0	9.1737E+00	3.7240E-19
4695.0	8.2721E+00	3.3580E-19	4745.0	1.1302E+01	4.5880E-19	4795.0	9.9423E+00	4.0360E-19
4696.0	7.9864E+00	3.2420E-19	4746.0	1.1359E+01	4.6110E-19	4796.0	1.0176E+01	4.1310E-19
4697.0	7.6440E+00	3.1030E-19	4747.0	1.1418E+01	4.6350E-19	4797.0	1.0334E+01	4.1950E-19
4698.0	7.4937E+00	3.0420E-19	4748.0	1.1876E+01	4.8210E-19	4798.0	1.0435E+01	4.2360E-19
4699.0	7.4715E+00	3.0330E-19	4749.0	1.2297E+01	4.9920E-19	4799.0	1.0733E+01	4.3570E-19
4700.0	7.8139E+00	3.1720E-19	4750.0	1.1948E+01	4.8500E-19	4800.0	1.0676E+01	4.3340E-19
4701.0	8.2081E+00	3.3320E-19	4751.0	1.1733E+01	4.7630E-19	4801.0	1.0120E+01	4.1080E-19
4702.0	8.4052E+00	3.4120E-19	4752.0	1.1312E+01	4.5920E-19	4802.0	9.4915E+00	3.8530E-19
4703.0	8.3460E+00	3.3880E-19	4753.0	1.1157E+01	4.5290E-19	4803.0	8.9841E+00	3.6470E-19
4704.0	8.3066E+00	3.3720E-19	4754.0	1.0933E+01	4.4380E-19	4804.0	8.7550E+00	3.5540E-19
4705.0	8.7279E+00	3.5430E-19	4755.0	1.0869E+01	4.4120E-19	4805.0	8.7993E+00	3.5720E-19
4706.0	8.9447E+00	3.6310E-19	4756.0	1.0768E+01	4.3710E-19	4806.0	8.9299E+00	3.6250E-19
4707.0	8.7156E+00	3.5380E-19	4757.0	1.0240E+01	4.1570E-19	4807.0	8.9299E+00	3.6250E-19
4708.0	8.3608E+00	3.3940E-19	4758.0	9.3856E+00	3.8100E-19	4808.0	8.6515E+00	3.5120E-19
4709.0	8.1219E+00	3.2970E-19	4759.0	9.0875E+00	3.6890E-19	4809.0	8.5062E+00	3.4530E-19
4710.0	7.9470E+00	3.2260E-19	4760.0	9.4028E+00	3.8170E-19	4810.0	8.4027E+00	3.4110E-19
4711.0	7.8681E+00	3.1940E-19	4761.0	9.3905E+00	3.8120E-19	4811.0	8.2229E+00	3.3380E-19
4712.0	8.0283E+00	3.2590E-19	4762.0	8.9852E+00	3.6150E-19	4812.0	8.4766E+00	3.4410E-19
4713.0	7.7696E+00	3.1540E-19	4763.0	8.9397E+00	3.6290E-19	4813.0	8.7303E+00	3.5440E-19
4714.0	7.5528E+00	3.0660E-19	4764.0	9.0555E+00	3.6760E-19	4814.0	9.2033E+00	3.7360E-19
4715.0	7.8164E+00	3.1730E-19	4765.0	8.8486E+00	3.5920E-19	4815.0	9.4940E+00	3.8540E-19
4716.0	7.9248E+00	3.2170E-19	4766.0	8.4002E+00	3.4100E-19	4816.0	9.1023E+00	3.6950E-19
4717.0	7.8731E+00	3.1960E-19	4767.0	8.3756E+00	3.4000E-19	4817.0	8.9052E+00	3.6150E-19
4718.0	8.2007E+00	3.3290E-19	4768.0	8.5628E+00	3.4760E-19	4818.0	8.5899E+00	3.4870E-19
4719.0	8.5357E+00	3.4650E-19	4769.0	8.2672E+00	3.3560E-19	4819.0	8.3682E+00	3.3970E-19
4720.0	8.8658E+00	3.5990E-19	4770.0	8.3042E+00	3.3710E-19	4820.0	8.2352E+00	3.3430E-19
4721.0	8.8855E+00	3.6070E-19	4771.0	8.1711E+00	3.3170E-19	4821.0	7.9273E+00	3.2180E-19
4722.0	8.6712E+00	3.5200E-19	4772.0	7.9322E+00	3.2200E-19	4822.0	7.6415E+00	3.1020E-19
4723.0	8.5431E+00	3.4680E-19	4773.0	7.9864E+00	3.2420E-19	4823.0	7.4420E+00	3.0210E-19
4724.0	8.5431E+00	3.4680E-19	4774.0	8.0997E+00	3.2880E-19	4824.0	7.1390E+00	2.8960E-19
4725.0	8.3584E+00	3.3930E-19	4775.0	8.0406E+00	3.2640E-19	4825.0	7.0257E+00	2.8520E-19
4726.0	8.0406E+00	3.2640E-19	4776.0	7.9667E+00	3.2340E-19	4826.0	7.1143E+00	2.8880E-19
4727.0	7.9765E+00	3.2380E-19	4777.0	8.1884E+00	3.3240E-19	4827.0	7.0183E+00	2.8490E-19
4728.0	8.2087E+00	3.3290E-19	4778.0	8.2598E+00	3.3530E-19	4828.0	6.9025E+00	2.8020E-19
4729.0	8.5012E+00	3.4510E-19	4779.0	8.0751E+00	3.2780E-19	4829.0	6.6660E+00	2.7060E-19
4730.0	8.4840E+00	3.4440E-19	4780.0	8.0061E+00	3.2500E-19	4830.0	6.4172E+00	2.6050E-19
4731.0	8.4181E+00	3.4140E-19	4781.0	8.3189E+00	3.3770E-19	4831.0	6.0896E+00	2.4720E-19
4732.0	8.3510E+00	3.3900E-19	4782.0	8.1539E+00	3.3100E-19	4832.0	5.8112E+00	2.3590E-19
4733.0	8.7057E+00	3.5340E-19	4783.0	7.8016E+00	3.1670E-19	4833.0	5.9738E+00	2.4250E-19
4734.0	9.1269E+00	3.7050E-19	4784.0	7.6883E+00	3.1210E-19	4834.0	6.0748E+00	2.4660E-19
4735.0	9.3363E+00	3.7900E-19	4785.0	7.7080E+00	3.1290E-19	4835.0	5.9664E+00	2.4220E-19
4736.0	9.7970E+00	3.9770E-19	4786.0	7.8041E+00	3.1680E-19	4836.0	5.7964E+00	2.3530E-19
4737.0	1.0809E+01	4.3880E-19	4787.0	7.7745E+00	3.1560E-19	4837.0	5.7299E+00	2.3260E-19
4738.0	1.1447E+01	4.6470E-19	4788.0	8.0627E+00	3.2730E-19	4838.0	5.8383E+00	2.3700E-19
4739.0	1.2243E+01	4.9700E-19	4789.0	8.2845E+00	3.3630E-19	4839.0	5.8605E+00	2.3790E-19

Table IV. NO2 GRAHAM AND JOHNSTON DATA AT 25C

WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)
4840.0	5.9418E+00	2.4120E-19	4890.0	1.2044E+01	4.8893E-19	4940.0	7.3163E+00	2.9700E-19
4841.0	6.2078E+00	2.5200E-19	4891.0	1.1137E+01	4.5210E-19	4941.0	7.6637E+00	3.1110E-19
4842.0	6.2965E+00	2.5560E-19	4892.0	1.0174E+01	4.1300E-19	4942.0	7.8780E+00	3.1980E-19
4843.0	6.2546E+00	2.5390E-19	4893.0	9.7305E+00	3.9500E-19	4943.0	7.8534E+00	3.1880E-19
4844.0	6.3999E+00	2.5980E-19	4894.0	9.6709E+00	4.0070E-19	4944.0	8.1514E+00	3.3090E-19
4845.0	6.5921E+00	2.6760E-19	4895.0	9.9694E+00	4.0470E-19	4945.0	8.4988E+00	3.4500E-19
4846.0	6.8015E+00	2.7610E-19	4896.0	9.8044E+00	3.9800E-19	4946.0	8.5037E+00	3.4520E-19
4847.0	6.7596E+00	2.7440E-19	4897.0	9.2674E+00	3.7620E-19	4947.0	8.5850E+00	3.4850E-19
4848.0	6.6192E+00	2.6870E-19	4898.0	9.0530E+00	3.6750E-19	4948.0	8.6712E+00	3.5200E-19
4849.0	6.7596E+00	2.7440E-19	4899.0	8.8757E+00	3.6030E-19	4949.0	8.9520E+00	3.6340E-19
4850.0	6.9542E+00	2.8230E-19	4900.0	8.5012E+00	3.4510E-19	4950.0	8.5677E+00	3.4760E-19
4851.0	6.8434E+00	2.7780E-19	4901.0	8.1736E+00	3.3180E-19	4951.0	8.1317E+00	3.3010E-19
4852.0	6.8557E+00	2.7830E-19	4902.0	7.7696E+00	3.1540E-19	4952.0	7.8657E+00	3.1930E-19
4853.0	6.9961E+00	2.8400E-19	4903.0	7.8041E+00	3.1680E-19	4953.0	7.7893E+00	3.1620E-19
4854.0	6.9197E+00	2.8090E-19	4904.0	8.1684E+00	3.3240E-19	4954.0	7.6370E+00	3.0880E-19
4855.0	6.7695E+00	2.7480E-19	4905.0	7.9691E+00	3.2350E-19	4955.0	7.3976E+00	3.0030E-19
4856.0	6.6192E+00	2.6870E-19	4906.0	7.5528E+00	3.0660E-19	4956.0	7.6144E+00	3.0910E-19
4857.0	6.6857E+00	2.7140E-19	4907.0	7.2720E+00	2.9520E-19	4957.0	7.9815E+00	3.2400E-19
4858.0	6.8976E+00	2.8000E-19	4908.0	6.9074E+00	2.8040E-19	4958.0	7.9642E+00	3.2330E-19
4859.0	6.9419E+00	2.8180E-19	4909.0	6.6832E+00	2.7130E-19	4959.0	8.0898E+00	3.2840E-19
4860.0	6.9715E+00	2.8300E-19	4910.0	6.5478E+00	2.6580E-19	4960.0	8.1169E+00	3.2950E-19
4861.0	7.0651E+00	2.8680E-19	4911.0	6.3433E+00	2.5750E-19	4961.0	7.9815E+00	3.2400E-19
4862.0	7.2277E+00	2.9340E-19	4912.0	6.0157E+00	2.4420E-19	4962.0	7.9174E+00	3.2140E-19
4863.0	7.3656E+00	2.9900E-19	4913.0	5.7028E+00	2.3150E-19	4963.0	7.8829E+00	3.2000E-19
4864.0	7.2695E+00	2.9510E-19	4914.0	5.5796E+00	2.2650E-19	4964.0	8.0283E+00	3.2590E-19
4865.0	6.8655E+00	2.7870E-19	4915.0	5.6782E+00	2.3050E-19	4965.0	8.0110E+00	3.2520E-19
4866.0	6.3950E+00	2.5960E-19	4916.0	5.6289E+00	2.2850E-19	4966.0	7.8829E+00	3.2000E-19
4867.0	6.1807E+00	2.5090E-19	4917.0	5.5525E+00	2.2540E-19	4967.0	8.0258E+00	3.2580E-19
4868.0	6.3113E+00	2.5620E-19	4918.0	5.8161E+00	2.3610E-19	4968.0	8.1096E+00	3.2920E-19
4869.0	6.3901E+00	2.5940E-19	4919.0	6.0378E+00	2.4510E-19	4969.0	8.1391E+00	3.3040E-19
4870.0	6.5527E+00	2.6600E-19	4920.0	6.3802E+00	2.5900E-19	4970.0	7.6366E+00	3.1000E-19
4871.0	6.5970E+00	2.6780E-19	4921.0	6.6808E+00	2.7120E-19	4971.0	7.1267E+00	2.8930E-19
4872.0	6.2842E+00	2.5510E-19	4922.0	6.6586E+00	2.7030E-19	4972.0	6.7522E+00	2.7410E-19
4873.0	6.0871E+00	2.4710E-19	4923.0	6.5921E+00	2.6760E-19	4973.0	6.4936E+00	2.6360E-19
4874.0	6.1955E+00	2.5150E-19	4924.0	6.4960E+00	2.6370E-19	4974.0	6.3482E+00	2.5770E-19
4875.0	6.2940E+00	2.5550E-19	4925.0	6.2521E+00	2.5380E-19	4975.0	6.1536E+00	2.4980E-19
4876.0	6.3926E+00	2.5950E-19	4926.0	5.9639E+00	2.4210E-19	4976.0	5.8851E+00	2.3890E-19
4877.0	6.6192E+00	2.6870E-19	4927.0	5.9910E+00	2.4320E-19	4977.0	5.6708E+00	2.3020E-19
4878.0	6.8384E+00	2.7760E-19	4928.0	6.2078E+00	2.5200E-19	4978.0	5.5304E+00	2.2450E-19
4879.0	7.1365E+00	2.8970E-19	4929.0	6.2669E+00	2.5440E-19	4979.0	5.3752E+00	2.1820E-19
4880.0	7.3237E+00	2.9730E-19	4930.0	6.2004E+00	2.5170E-19	4980.0	5.3165E+00	2.1590E-19
4881.0	7.5257E+00	3.0550E-19	4931.0	6.3113E+00	2.5620E-19	4981.0	5.4638E+00	2.2180E-19
4882.0	7.8435E+00	3.1840E-19	4932.0	6.6389E+00	2.6950E-19	4982.0	5.4441E+00	2.2100E-19
4883.0	8.1958E+00	3.3270E-19	4933.0	6.9074E+00	2.8040E-19	4983.0	5.0919E+00	2.0670E-19
4884.0	8.9939E+00	3.6510E-19	4934.0	7.1168E+00	2.8890E-19	4984.0	4.7174E+00	1.9150E-19
4885.0	9.9473E+00	4.0380E-19	4935.0	7.2523E+00	2.9440E-19	4985.0	4.6189E+00	1.8750E-19
4886.0	1.0216E+01	4.1470E-19	4936.0	7.3738E+00	2.9930E-19	4986.0	4.7051E+00	1.9100E-19
4887.0	1.0551E+01	4.2830E-19	4937.0	7.5060E+00	3.0470E-19	4987.0	4.6731E+00	1.8970E-19
4888.0	1.1083E+01	4.4990E-19	4938.0	7.4198E+00	3.0120E-19	4988.0	4.6140E+00	1.8730E-19
4889.0	1.1780E+01	4.7820E-19	4939.0	7.2449E+00	2.9410E-19	4989.0	4.5992E+00	1.8670E-19

Table IV. NO2 GRAHAM AND JOHNSTON DATA AT 25C

WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)
4990.0	4.4612E+00	1.8110E-19	5040.0	5.1067E+00	2.0730E-19	5090.0	5.4023E+00	2.1930E-19
4991.0	4.3898E+00	1.7820E-19	5041.0	5.1387E+00	2.0860E-19	5091.0	5.6461E+00	2.2920E-19
4992.0	4.4169E+00	1.7930E-19	5042.0	5.3136E+00	2.1570E-19	5092.0	5.9344E+00	2.4090E-19
4993.0	4.3233E+00	1.7550E-19	5043.0	5.6609E+00	2.2980E-19	5093.0	6.2398E+00	2.5330E-19
4994.0	4.1385E+00	1.6800E-19	5044.0	6.1019E+00	2.4770E-19	5094.0	6.3408E+00	2.5740E-19
4995.0	4.0030E+00	1.6250E-19	5045.0	6.5921E+00	2.6760E-19	5095.0	6.1487E+00	2.4960E-19
4996.0	3.8602E+00	1.5670E-19	5046.0	6.9813E+00	2.8340E-19	5096.0	6.0157E+00	2.4420E-19
4997.0	3.8676E+00	1.5700E-19	5047.0	7.1414E+00	2.8990E-19	5097.0	6.0033E+00	2.4370E-19
4998.0	3.8971E+00	1.5820E-19	5048.0	7.3607E+00	2.9880E-19	5098.0	6.2004E+00	2.5170E-19
4999.0	3.8947E+00	1.5810E-19	5049.0	7.9199E+00	3.2150E-19	5099.0	6.7227E+00	2.7290E-19
5000.0	3.8725E+00	1.5720E-19	5050.0	8.4741E+00	3.4400E-19	5100.0	7.0257E+00	2.8520E-19
5001.0	3.8749E+00	1.5730E-19	5051.0	8.4323E+00	3.4230E-19	5101.0	6.8237E+00	2.7700E-19
5002.0	3.8552E+00	1.5650E-19	5052.0	7.8952E+00	3.2050E-19	5102.0	6.5157E+00	2.6450E-19
5003.0	3.7542E+00	1.5240E-19	5053.0	7.4518E+00	3.0250E-19	5103.0	6.3482E+00	2.5770E-19
5004.0	3.6409E+00	1.4780E-19	5054.0	7.3139E+00	2.9690E-19	5104.0	6.2916E+00	2.5540E-19
5005.0	3.6779E+00	1.4930E-19	5055.0	7.2794E+00	2.9550E-19	5105.0	6.2127E+00	2.5220E-19
5006.0	3.7838E+00	1.5360E-19	5056.0	7.0700E+00	2.8700E-19	5106.0	6.0723E+00	2.4650E-19
5007.0	3.8577E+00	1.5660E-19	5057.0	6.6364E+00	2.6940E-19	5107.0	6.0107E+00	2.4400E-19
5008.0	3.9168E+00	1.5900E-19	5058.0	6.1979E+00	2.5160E-19	5108.0	5.9516E+00	2.4160E-19
5009.0	3.9686E+00	1.6110E-19	5059.0	5.8580E+00	2.3780E-19	5109.0	5.8186E+00	2.3620E-19
5010.0	4.0277E+00	1.6350E-19	5060.0	5.5599E+00	2.2570E-19	5110.0	5.8309E+00	2.3670E-19
5011.0	4.0868E+00	1.6590E-19	5061.0	5.3727E+00	2.1810E-19	5111.0	5.9171E+00	2.4020E-19
5012.0	4.2568E+00	1.7280E-19	5062.0	5.3185E+00	2.1590E-19	5112.0	5.8654E+00	2.3810E-19
5013.0	4.5598E+00	1.8510E-19	5063.0	5.3234E+00	2.1610E-19	5113.0	5.7792E+00	2.3460E-19
5014.0	4.7224E+00	1.9170E-19	5064.0	5.4047E+00	2.1940E-19	5114.0	5.8038E+00	2.3560E-19
5015.0	4.6066E+00	1.8700E-19	5065.0	5.5673E+00	2.2600E-19	5115.0	5.9368E+00	2.4100E-19
5016.0	4.3923E+00	1.7830E-19	5066.0	5.6856E+00	2.3060E-19	5116.0	6.1093E+00	2.4800E-19
5017.0	4.3258E+00	1.7560E-19	5067.0	5.6117E+00	2.2780E-19	5117.0	6.0181E+00	2.4430E-19
5018.0	4.4169E+00	1.7930E-19	5068.0	5.4515E+00	2.2130E-19	5118.0	5.6016E+00	2.2740E-19
5019.0	4.5007E+00	1.8270E-19	5069.0	5.3284E+00	2.1630E-19	5119.0	5.2372E+00	2.1260E-19
5020.0	4.5622E+00	1.8520E-19	5070.0	5.2816E+00	2.1440E-19	5120.0	5.1633E+00	2.0960E-19
5021.0	4.7174E+00	1.9150E-19	5071.0	5.3013E+00	2.1520E-19	5121.0	5.2988E+00	2.1510E-19
5022.0	4.9761E+00	2.0200E-19	5072.0	5.1732E+00	2.1000E-19	5122.0	5.4860E+00	2.2270E-19
5023.0	5.2126E+00	2.1160E-19	5073.0	4.9499E+00	2.0090E-19	5123.0	5.6215E+00	2.2820E-19
5024.0	5.3826E+00	2.1850E-19	5074.0	4.8357E+00	1.9630E-19	5124.0	5.7324E+00	2.3270E-19
5025.0	5.5821E+00	2.2660E-19	5075.0	4.7076E+00	1.9110E-19	5125.0	5.8728E+00	2.3840E-19
5026.0	5.8432E+00	2.3720E-19	5076.0	4.5869E+00	1.8620E-19	5126.0	5.9615E+00	2.4200E-19
5027.0	6.0822E+00	2.4690E-19	5077.0	4.6238E+00	1.8770E-19	5127.0	6.0428E+00	2.4530E-19
5028.0	6.2275E+00	2.5280E-19	5078.0	4.5943E+00	1.8650E-19	5128.0	6.1684E+00	2.5040E-19
5029.0	6.3876E+00	2.5930E-19	5079.0	4.4292E+00	1.7980E-19	5129.0	6.0083E+00	2.4390E-19
5030.0	6.7350E+00	2.7340E-19	5080.0	4.4489E+00	1.8060E-19	5130.0	5.5821E+00	2.2660E-19
5031.0	7.0996E+00	2.8820E-19	5081.0	4.6090E+00	1.8710E-19	5131.0	5.2397E+00	2.1270E-19
5032.0	7.0207E+00	2.8500E-19	5082.0	4.7569E+00	1.9310E-19	5132.0	5.0623E+00	2.0550E-19
5033.0	6.4369E+00	2.6130E-19	5083.0	4.8874E+00	1.9840E-19	5133.0	5.0057E+00	2.0320E-19
5034.0	5.8999E+00	2.3950E-19	5084.0	4.8825E+00	1.9820E-19	5134.0	4.8997E+00	1.9890E-19
5035.0	5.7077E+00	2.3170E-19	5085.0	4.8554E+00	1.9710E-19	5135.0	4.6879E+00	1.9030E-19
5036.0	5.5279E+00	2.2440E-19	5086.0	5.0796E+00	2.0620E-19	5136.0	4.5327E+00	1.8400E-19
5037.0	5.2397E+00	2.1270E-19	5087.0	5.5082E+00	2.2360E-19	5137.0	4.4859E+00	1.8210E-19
5038.0	5.1067E+00	2.0730E-19	5088.0	5.6831E+00	2.3070E-19	5138.0	4.5105E+00	1.8310E-19
5039.0	5.1140E+00	2.0760E-19	5089.0	5.4668E+00	2.2200E-19	5139.0	4.5278E+00	1.8380E-19

Table IV. NO2 GRAHAM AND JOHNSTON DATA AT 25C

WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)
5140.0	4.4144E+00	1.7920E-19	5190.0	4.5721E+00	1.8560E-19	5240.0	3.4143E+00	1.3860E-19
5141.0	4.1681E+00	1.6920E-19	5191.0	4.2839E+00	1.7390E-19	5241.0	3.4759E+00	1.4110E-19
5142.0	3.9809E+00	1.6160E-19	5192.0	4.1755E+00	1.6950E-19	5242.0	3.6114E+00	1.4660E-19
5143.0	4.0400E+00	1.6400E-19	5193.0	4.2863E+00	1.7400E-19	5243.0	3.6779E+00	1.4930E-19
5144.0	4.1779E+00	1.6960E-19	5194.0	4.4686E+00	1.8140E-19	5244.0	3.7444E+00	1.5200E-19
5145.0	4.2248E+00	1.7150E-19	5195.0	4.5376E+00	1.8420E-19	5245.0	3.8725E+00	1.5720E-19
5146.0	4.1903E+00	1.7010E-19	5196.0	4.5204E+00	1.8350E-19	5246.0	3.9464E+00	1.6020E-19
5147.0	4.1311E+00	1.6770E-19	5197.0	4.5228E+00	1.8360E-19	5247.0	4.0252E+00	1.6340E-19
5148.0	4.1186E+00	1.6720E-19	5198.0	4.5130E+00	1.8320E-19	5248.0	4.1632E+00	1.6900E-19
5149.0	4.0794E+00	1.6560E-19	5199.0	4.3972E+00	1.7850E-19	5249.0	4.3627E+00	1.7710E-19
5150.0	3.9513E+00	1.6040E-19	5200.0	4.3676E+00	1.7730E-19	5250.0	4.7174E+00	1.9150E-19
5151.0	3.8281E+00	1.5540E-19	5201.0	4.4982E+00	1.8260E-19	5251.0	5.2052E+00	2.1130E-19
5152.0	3.7518E+00	1.5230E-19	5202.0	4.6164E+00	1.8740E-19	5252.0	5.5107E+00	2.2370E-19
5153.0	3.7025E+00	1.5030E-19	5203.0	4.6706E+00	1.8960E-19	5253.0	5.5131E+00	2.2380E-19
5154.0	3.6335E+00	1.4750E-19	5204.0	4.6288E+00	1.8790E-19	5254.0	5.5402E+00	2.2490E-19
5155.0	3.5522E+00	1.4420E-19	5205.0	4.4539E+00	1.8080E-19	5255.0	5.6929E+00	2.3110E-19
5156.0	3.5325E+00	1.4340E-19	5206.0	4.1977E+00	1.7040E-19	5256.0	5.8210E+00	2.3630E-19
5157.0	3.5966E+00	1.4600E-19	5207.0	4.0326E+00	1.6370E-19	5257.0	5.8555E+00	2.3770E-19
5158.0	3.6902E+00	1.4980E-19	5208.0	3.9858E+00	1.6180E-19	5258.0	5.6954E+00	2.3120E-19
5159.0	3.7542E+00	1.5240E-19	5209.0	3.9489E+00	1.6030E-19	5259.0	5.3826E+00	2.1850E-19
5160.0	3.7567E+00	1.5250E-19	5210.0	3.9193E+00	1.5910E-19	5260.0	5.1461E+00	2.0890E-19
5161.0	3.6729E+00	1.4910E-19	5211.0	3.9119E+00	1.5880E-19	5261.0	5.1214E+00	2.0790E-19
5162.0	3.5178E+00	1.4280E-19	5212.0	3.8971E+00	1.5820E-19	5262.0	5.2175E+00	2.1180E-19
5163.0	3.4266E+00	1.3910E-19	5213.0	3.7961E+00	1.5410E-19	5263.0	5.2175E+00	2.1180E-19
5164.0	3.4660E+00	1.4070E-19	5214.0	3.5818E+00	1.4540E-19	5264.0	5.0968E+00	2.0690E-19
5165.0	3.5178E+00	1.4280E-19	5215.0	3.3872E+00	1.3750E-19	5265.0	5.1214E+00	2.0790E-19
5166.0	3.5646E+00	1.4470E-19	5216.0	3.3256E+00	1.3500E-19	5266.0	5.2643E+00	2.1370E-19
5167.0	3.6138E+00	1.4670E-19	5217.0	3.4044E+00	1.3820E-19	5267.0	5.2963E+00	2.1500E-19
5168.0	3.5596E+00	1.4450E-19	5218.0	3.5128E+00	1.4260E-19	5268.0	5.2963E+00	2.1500E-19
5169.0	3.3675E+00	1.3670E-19	5219.0	3.5054E+00	1.4230E-19	5269.0	5.3087E+00	2.1550E-19
5170.0	3.2123E+00	1.3040E-19	5220.0	3.4192E+00	1.3880E-19	5270.0	5.1461E+00	2.0890E-19
5171.0	3.1285E+00	1.2700E-19	5221.0	3.3798E+00	1.3720E-19	5271.0	4.8431E+00	1.9660E-19
5172.0	3.0128E+00	1.2230E-19	5222.0	3.4217E+00	1.3890E-19	5272.0	4.5622E+00	1.8520E-19
5173.0	2.9610E+00	1.2020E-19	5223.0	3.4586E+00	1.4040E-19	5273.0	4.2666E+00	1.7320E-19
5174.0	3.0448E+00	1.2360E-19	5224.0	3.4414E+00	1.3970E-19	5274.0	3.9784E+00	1.6150E-19
5175.0	3.1556E+00	1.2810E-19	5225.0	3.3699E+00	1.3680E-19	5275.0	3.8552E+00	1.5650E-19
5176.0	3.2295E+00	1.3110E-19	5226.0	3.2911E+00	1.3360E-19	5276.0	3.9341E+00	1.5970E-19
5177.0	3.2320E+00	1.3120E-19	5227.0	3.3108E+00	1.3440E-19	5277.0	4.1090E+00	1.6680E-19
5178.0	3.1310E+00	1.2710E-19	5228.0	3.4192E+00	1.3880E-19	5278.0	4.2445E+00	1.7230E-19
5179.0	3.0448E+00	1.2360E-19	5229.0	3.5449E+00	1.4390E-19	5279.0	4.2937E+00	1.7430E-19
5180.0	3.1556E+00	1.2810E-19	5230.0	3.6385E+00	1.4770E-19	5280.0	4.3159E+00	1.7520E-19
5181.0	3.4044E+00	1.3820E-19	5231.0	3.6459E+00	1.4800E-19	5281.0	4.3627E+00	1.7710E-19
5182.0	3.6064E+00	1.4640E-19	5232.0	3.6826E+00	1.4950E-19	5282.0	4.4243E+00	1.7960E-19
5183.0	3.7247E+00	1.5120E-19	5233.0	3.7666E+00	1.5290E-19	5283.0	4.4341E+00	1.8000E-19
5184.0	3.8626E+00	1.5680E-19	5234.0	3.8084E+00	1.5460E-19	5284.0	4.3134E+00	1.7510E-19
5185.0	4.1927E+00	1.7020E-19	5235.0	3.7198E+00	1.5100E-19	5285.0	4.1582E+00	1.6880E-19
5186.0	4.6288E+00	1.8790E-19	5236.0	3.4709E+00	1.4090E-19	5286.0	4.0726E+00	1.6530E-19
5187.0	4.8800E+00	1.9810E-19	5237.0	3.2763E+00	1.3300E-19	5287.0	3.9759E+00	1.6140E-19
5188.0	4.9613E+00	2.0140E-19	5238.0	3.2862E+00	1.3340E-19	5288.0	3.8725E+00	1.5720E-19
5189.0	4.8726E+00	1.9780E-19	5239.0	3.3749E+00	1.3700E-19	5289.0	3.7764E+00	1.5330E-19

Table IV. NO2 GRAHAM AND JOHNSTON DATA AT 25C

WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)
5290.0	3.6680E+00	1.4890E-19	5340.0	2.9438E+00	1.1950E-19	5390.0	2.8674E+00	1.1640E-19
5291.0	3.5966E+00	1.4600E-19	5341.0	2.9561E+00	1.2000E-19	5391.0	2.8009E+00	1.1370E-19
5292.0	3.5621E+00	1.4460E-19	5342.0	3.0497E+00	1.2360E-19	5392.0	2.8600E+00	1.1610E-19
5293.0	3.5547E+00	1.4430E-19	5343.0	3.1384E+00	1.2740E-19	5393.0	2.9733E+00	1.2070E-19
5294.0	3.5818E+00	1.4540E-19	5344.0	3.0620E+00	1.2430E-19	5394.0	3.1138E+00	1.2640E-19
5295.0	3.6089E+00	1.4650E-19	5345.0	2.9487E+00	1.1970E-19	5395.0	3.2098E+00	1.3030E-19
5296.0	3.5966E+00	1.4600E-19	5346.0	2.9487E+00	1.1970E-19	5396.0	3.1655E+00	1.2850E-19
5297.0	3.4660E+00	1.4070E-19	5347.0	2.9364E+00	1.1920E-19	5397.0	2.9610E+00	1.2020E-19
5298.0	3.2714E+00	1.3280E-19	5348.0	2.8034E+00	1.1380E-19	5398.0	2.6876E+00	1.0910E-19
5299.0	3.2049E+00	1.3010E-19	5349.0	2.6851E+00	1.0900E-19	5399.0	2.5373E+00	1.0300E-19
5300.0	3.2887E+00	1.3350E-19	5350.0	2.6359E+00	1.0700E-19	5400.0	2.4979E+00	1.0140E-19
5301.0	3.4020E+00	1.3810E-19	5351.0	2.5989E+00	1.0550E-19	5401.0	2.4314E+00	9.8700E-20
5302.0	3.4808E+00	1.4130E-19	5352.0	2.5275E+00	1.0260E-19	5402.0	2.3698E+00	9.6200E-20
5303.0	3.5424E+00	1.4380E-19	5353.0	2.3649E+00	9.6000E-20	5403.0	2.3353E+00	9.4800E-20
5304.0	3.6557E+00	1.4840E-19	5354.0	2.1382E+00	6.6800E-20	5404.0	2.2392E+00	9.0900E-20
5305.0	3.8281E+00	1.5540E-19	5355.0	1.9658E+00	7.9800E-20	5405.0	2.0939E+00	8.5000E-20
5306.0	3.9489E+00	1.6030E-19	5356.0	1.9091E+00	7.7500E-20	5406.0	1.9954E+00	8.1000E-20
5307.0	3.9883E+00	1.6190E-19	5357.0	1.9141E+00	7.7700E-20	5407.0	1.9239E+00	7.8100E-20
5308.0	3.9316E+00	1.5960E-19	5358.0	1.9215E+00	7.8000E-20	5408.0	1.8326E+00	7.4400E-20
5309.0	3.7345E+00	1.5160E-19	5359.0	1.9584E+00	7.9500E-20	5409.0	1.7761E+00	7.2100E-20
5310.0	3.5350E+00	1.4350E-19	5360.0	1.9855E+00	8.0600E-20	5410.0	1.8057E+00	7.3300E-20
5311.0	3.4636E+00	1.4060E-19	5361.0	1.9559E+00	7.9400E-20	5411.0	1.8845E+00	7.6500E-20
5312.0	3.4956E+00	1.4190E-19	5362.0	1.9239E+00	7.8100E-20	5412.0	1.9658E+00	7.9800E-20
5313.0	3.5572E+00	1.4440E-19	5363.0	1.9535E+00	7.9300E-20	5413.0	2.0422E+00	8.2900E-20
5314.0	3.6188E+00	1.4690E-19	5364.0	2.0890E+00	8.4800E-20	5414.0	2.1382E+00	8.6800E-20
5315.0	3.6927E+00	1.4990E-19	5365.0	2.2146E+00	8.9900E-20	5415.0	2.2491E+00	9.1300E-20
5316.0	3.7099E+00	1.5060E-19	5366.0	2.2195E+00	9.0100E-20	5416.0	2.3082E+00	9.3700E-20
5317.0	3.6459E+00	1.4800E-19	5367.0	2.2146E+00	8.9900E-20	5417.0	2.3599E+00	9.5800E-20
5318.0	3.6385E+00	1.4770E-19	5368.0	2.2048E+00	8.9500E-20	5418.0	2.5896E+00	1.0510E-19
5319.0	3.7395E+00	1.5180E-19	5369.0	2.1013E+00	8.5300E-20	5419.0	2.9093E+00	1.1810E-19
5320.0	3.8208E+00	1.5510E-19	5370.0	1.9630E+00	8.0500E-20	5420.0	3.0916E+00	1.2550E-19
5321.0	3.7912E+00	1.5390E-19	5371.0	1.9141E+00	7.7700E-20	5421.0	3.1285E+00	1.2700E-19
5322.0	3.7296E+00	1.5140E-19	5372.0	1.8820E+00	7.6400E-20	5422.0	3.1088E+00	1.2620E-19
5323.0	3.7148E+00	1.5080E-19	5373.0	1.8944E+00	7.6900E-20	5423.0	3.1606E+00	1.2830E-19
5324.0	3.7739E+00	1.5320E-19	5374.0	1.9559E+00	7.9400E-20	5424.0	3.2960E+00	1.3380E-19
5325.0	3.8602E+00	1.5670E-19	5375.0	2.0299E+00	8.2400E-20	5425.0	3.4217E+00	1.3890E-19
5326.0	3.9119E+00	1.5880E-19	5376.0	2.0249E+00	8.2200E-20	5426.0	3.4980E+00	1.4200E-19
5327.0	3.9513E+00	1.6040E-19	5377.0	1.9732E+00	8.0100E-20	5427.0	3.4783E+00	1.4120E-19
5328.0	3.9883E+00	1.6190E-19	5378.0	1.9461E+00	7.9000E-20	5428.0	3.3823E+00	1.3730E-19
5329.0	3.9686E+00	1.6110E-19	5379.0	1.9486E+00	7.9100E-20	5429.0	3.3429E+00	1.3570E-19
5330.0	3.8626E+00	1.5680E-19	5380.0	1.9806E+00	8.0400E-20	5430.0	3.4266E+00	1.3910E-19
5331.0	3.7395E+00	1.5180E-19	5381.0	2.0742E+00	8.4200E-20	5431.0	3.5399E+00	1.4370E-19
5332.0	3.6261E+00	1.4720E-19	5382.0	2.3353E+00	9.4800E-20	5432.0	3.5744E+00	1.4510E-19
5333.0	3.5399E+00	1.4370E-19	5383.0	2.6432E+00	1.0730E-19	5433.0	3.6286E+00	1.4730E-19
5334.0	3.5966E+00	1.4600E-19	5384.0	2.7492E+00	1.1160E-19	5434.0	3.6902E+00	1.4980E-19
5335.0	3.7099E+00	1.5060E-19	5385.0	2.7615E+00	1.1210E-19	5435.0	3.5843E+00	1.4550E-19
5336.0	3.6261E+00	1.4720E-19	5386.0	2.9364E+00	1.1920E-19	5436.0	3.4537E+00	1.4020E-19
5337.0	3.3379E+00	1.3550E-19	5387.0	3.1753E+00	1.2890E-19	5437.0	3.4537E+00	1.4020E-19
5338.0	3.0669E+00	1.2450E-19	5388.0	3.1950E+00	1.2970E-19	5438.0	3.4882E+00	1.4160E-19
5339.0	2.9586E+00	1.2010E-19	5389.0	3.0325E+00	1.2310E-19	5439.0	3.4291E+00	1.3920E-19

Table IV. NO2 GRAHAM AND JOHNSTON DATA AT 25C

WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)
5440.0	3.2911E+00	1.3360E-19	5490.0	3.1606E+00	1.2830E-19	5540.0	2.2589E+00	9.1700E-20
5441.0	3.1335E+00	1.2720E-19	5491.0	3.0325E+00	1.2310E-19	5541.0	2.3723E+00	9.6300E-20
5442.0	3.0349E+00	1.2320E-19	5492.0	3.0128E+00	1.2230E-19	5542.0	2.4043E+00	9.7600E-20
5443.0	3.0399E+00	1.2340E-19	5493.0	3.1532E+00	1.2800E-19	5543.0	2.3501E+00	9.5400E-20
5444.0	3.0177E+00	1.2250E-19	5494.0	3.3256E+00	1.3500E-19	5544.0	2.3033E+00	9.3500E-20
5445.0	2.8920E+00	1.1740E-19	5495.0	3.4020E+00	1.3810E-19	5545.0	2.2688E+00	9.2100E-20
5446.0	2.7886E+00	1.1320E-19	5496.0	3.3231E+00	1.3490E-19	5546.0	2.2368E+00	9.0800E-20
5447.0	2.8157E+00	1.1430E-19	5497.0	3.1433E+00	1.2760E-19	5547.0	2.2097E+00	8.9700E-20
5448.0	2.9265E+00	1.1880E-19	5498.0	2.9955E+00	1.2160E-19	5548.0	2.1382E+00	8.6800E-20
5449.0	3.0522E+00	1.2390E-19	5499.0	2.9019E+00	1.1780E-19	5549.0	2.0249E+00	8.2200E-20
5450.0	3.1409E+00	1.2750E-19	5500.0	2.7960E+00	1.1350E-19	5550.0	1.9091E+00	7.7500E-20
5451.0	3.2123E+00	1.3040E-19	5501.0	2.6679E+00	1.0830E-19	5551.0	1.8180E+00	7.3800E-20
5452.0	3.3404E+00	1.3560E-19	5502.0	2.5693E+00	1.0430E-19	5552.0	1.7441E+00	7.0800E-20
5453.0	3.5695E+00	1.4490E-19	5503.0	2.5299E+00	1.0270E-19	5553.0	1.6850E+00	6.8400E-20
5454.0	3.8626E+00	1.5680E-19	5504.0	2.5349E+00	1.0290E-19	5554.0	1.6800E+00	6.8200E-20
5455.0	3.9833E+00	1.6170E-19	5505.0	2.5151E+00	1.0210E-19	5555.0	1.7022E+00	6.9100E-20
5456.0	3.8355E+00	1.5570E-19	5506.0	2.4807E+00	1.0070E-19	5556.0	1.6899E+00	6.8600E-20
5457.0	3.5818E+00	1.4540E-19	5507.0	2.4856E+00	1.0090E-19	5557.0	1.6800E+00	6.8200E-20
5458.0	3.3823E+00	1.3730E-19	5508.0	2.4536E+00	9.9600E-20	5558.0	1.6626E+00	6.7500E-20
5459.0	3.2443E+00	1.3170E-19	5509.0	2.3772E+00	9.6500E-20	5559.0	1.5569E+00	6.3200E-20
5460.0	3.0719E+00	1.2470E-19	5510.0	2.3427E+00	9.5100E-20	5560.0	1.4312E+00	5.8100E-20
5461.0	2.8896E+00	1.1730E-19	5511.0	2.3624E+00	9.5900E-20	5561.0	1.3844E+00	5.6200E-20
5462.0	2.7664E+00	1.1230E-19	5512.0	2.3599E+00	9.5800E-20	5562.0	1.3746E+00	5.5800E-20
5463.0	2.7221E+00	1.1050E-19	5513.0	2.2589E+00	9.1700E-20	5563.0	1.3426E+00	5.4500E-20
5464.0	2.7418E+00	1.1130E-19	5514.0	2.1136E+00	8.5800E-20	5564.0	1.3352E+00	5.4200E-20
5465.0	2.7886E+00	1.1320E-19	5515.0	2.0446E+00	8.3000E-20	5565.0	1.3869E+00	5.6300E-20
5466.0	2.7886E+00	1.1320E-19	5516.0	2.0372E+00	8.2700E-20	5566.0	1.4460E+00	5.8700E-20
5467.0	2.6457E+00	1.0740E-19	5517.0	2.0446E+00	8.3000E-20	5567.0	1.4904E+00	6.0500E-20
5468.0	2.4339E+00	9.8800E-20	5518.0	2.0865E+00	8.4700E-20	5568.0	1.5523E+00	6.3000E-20
5469.0	2.3402E+00	9.5000E-20	5519.0	2.1407E+00	8.6900E-20	5569.0	1.5864E+00	6.4400E-20
5470.0	2.3452E+00	9.5200E-20	5520.0	2.1678E+00	8.8000E-20	5570.0	1.5372E+00	6.2400E-20
5471.0	2.3723E+00	9.6300E-20	5521.0	2.1801E+00	8.8500E-20	5571.0	1.4682E+00	5.9600E-20
5472.0	2.4609E+00	9.9900E-20	5522.0	2.1678E+00	8.8000E-20	5572.0	1.4608E+00	5.9300E-20
5473.0	2.5521E+00	1.0360E-19	5523.0	2.1111E+00	8.5700E-20	5573.0	1.4926E+00	6.0600E-20
5474.0	2.6556E+00	1.0780E-19	5524.0	2.0914E+00	8.4900E-20	5574.0	1.4879E+00	6.0400E-20
5475.0	2.9265E+00	1.1880E-19	5525.0	2.2072E+00	8.9600E-20	5575.0	1.4559E+00	5.9100E-20
5476.0	3.1581E+00	1.2820E-19	5526.0	2.4240E+00	9.8400E-20	5576.0	1.4510E+00	5.8900E-20
5477.0	3.1679E+00	1.2860E-19	5527.0	2.5349E+00	1.0290E-19	5577.0	1.4707E+00	5.9700E-20
5478.0	3.1606E+00	1.2830E-19	5528.0	2.4585E+00	9.9800E-20	5578.0	1.4534E+00	5.9000E-20
5479.0	3.2443E+00	1.3170E-19	5529.0	2.3599E+00	9.5800E-20	5579.0	1.4214E+00	5.7700E-20
5480.0	3.3182E+00	1.3470E-19	5530.0	2.3353E+00	9.4800E-20	5580.0	1.4288E+00	5.8000E-20
5481.0	3.2960E+00	1.3380E-19	5531.0	2.4659E+00	1.0010E-19	5581.0	1.4707E+00	5.9700E-20
5482.0	3.2123E+00	1.3040E-19	5532.0	2.7516E+00	1.1170E-19	5582.0	1.5298E+00	6.2100E-20
5483.0	3.1630E+00	1.2840E-19	5533.0	2.9019E+00	1.1780E-19	5583.0	1.6037E+00	6.5100E-20
5484.0	3.1803E+00	1.2910E-19	5534.0	2.8896E+00	1.1730E-19	5584.0	1.6554E+00	6.7200E-20
5485.0	3.1679E+00	1.2860E-19	5535.0	2.8945E+00	1.1750E-19	5585.0	1.6283E+00	6.6100E-20
5486.0	3.0349E+00	1.2320E-19	5536.0	2.8058E+00	1.1390E-19	5586.0	1.5520E+00	6.3000E-20
5487.0	2.8970E+00	1.1760E-19	5537.0	2.5546E+00	1.0370E-19	5587.0	1.4756E+00	5.9900E-20
5488.0	2.9659E+00	1.2040E-19	5538.0	2.2934E+00	9.3100E-20	5588.0	1.4091E+00	5.7200E-20
5489.0	3.1507E+00	1.2790E-19	5539.0	2.1924E+00	8.9000E-20	5589.0	1.3795E+00	5.6000E-20

Table IV. NO2 GRAHAM AND JOHNSTON DATA AT 25C

WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)
5590.0	1.3524E+00	5.4900E-20	5640.0	3.1014E+00	1.2590E-19	5690.0	1.6899E+00	6.8600E-20
5591.0	1.3278E+00	5.3900E-20	5641.0	2.8797E+00	1.1690E-19	5691.0	1.6283E+00	6.6100E-20
5592.0	1.2958E+00	5.2600E-20	5642.0	2.5250E+00	1.0250E-19	5692.0	1.6825E+00	6.8300E-20
5593.0	1.2169E+00	4.9400E-20	5643.0	2.3427E+00	9.5100E-20	5693.0	1.7687E+00	7.1800E-20
5594.0	1.1233E+00	4.5600E-20	5644.0	2.3723E+00	9.6300E-20	5694.0	1.8106E+00	7.3500E-20
5595.0	1.0740E+00	4.3600E-20	5645.0	2.6531E+00	1.0770E-19	5695.0	1.7663E+00	7.1700E-20
5596.0	1.0740E+00	4.3600E-20	5646.0	3.0103E+00	1.2220E-19	5696.0	1.7022E+00	6.9100E-20
5597.0	1.1307E+00	4.5900E-20	5647.0	3.1433E+00	1.2760E-19	5697.0	1.6874E+00	6.8500E-20
5598.0	1.1972E+00	4.8600E-20	5648.0	3.1187E+00	1.2660E-19	5698.0	1.6529E+00	6.7100E-20
5599.0	1.2145E+00	4.9300E-20	5649.0	3.0719E+00	1.2470E-19	5699.0	1.6185E+00	6.5700E-20
5600.0	1.1874E+00	4.8200E-20	5650.0	2.9389E+00	1.1930E-19	5700.0	1.6702E+00	6.7800E-20
5601.0	1.1504E+00	4.6700E-20	5651.0	2.7418E+00	1.1130E-19	5701.0	1.7737E+00	7.2000E-20
5602.0	1.1627E+00	4.7200E-20	5652.0	2.5964E+00	1.0540E-19	5702.0	1.8574E+00	7.5400E-20
5603.0	1.2514E+00	5.0800E-20	5653.0	2.4659E+00	1.0010E-19	5703.0	1.9486E+00	7.9100E-20
5604.0	1.3229E+00	5.3700E-20	5654.0	2.3279E+00	9.4500E-20	5704.0	2.0569E+00	8.3500E-20
5605.0	1.3130E+00	5.3300E-20	5655.0	2.2663E+00	9.2000E-20	5705.0	2.0891E+00	8.4800E-20
5606.0	1.3155E+00	5.3400E-20	5656.0	2.2865E+00	9.2900E-20	5706.0	2.0346E+00	8.2600E-20
5607.0	1.3746E+00	5.5800E-20	5657.0	2.3427E+00	9.5100E-20	5707.0	2.0520E+00	8.3300E-20
5608.0	1.3943E+00	5.6600E-20	5658.0	2.3599E+00	9.5800E-20	5708.0	2.2442E+00	9.1100E-20
5609.0	1.3779E+00	5.5900E-20	5659.0	2.3033E+00	9.3500E-20	5709.0	2.4856E+00	1.0090E-19
5610.0	1.3992E+00	5.6800E-20	5660.0	2.1604E+00	8.7700E-20	5710.0	2.6777E+00	1.0870E-19
5611.0	1.4485E+00	5.8800E-20	5661.0	1.9190E+00	7.7900E-20	5711.0	2.7221E+00	1.1050E-19
5612.0	1.4633E+00	5.9400E-20	5662.0	1.6776E+00	6.8100E-20	5712.0	2.5102E+00	1.0190E-19
5613.0	1.4830E+00	6.0200E-20	5663.0	1.5347E+00	6.2300E-20	5713.0	2.3370E+00	9.4900E-20
5614.0	1.5421E+00	6.2600E-20	5664.0	1.4362E+00	5.8300E-20	5714.0	2.3969E+00	9.7300E-20
5615.0	1.5815E+00	6.4200E-20	5665.0	1.3352E+00	5.4200E-20	5715.0	2.4437E+00	9.9200E-20
5616.0	1.5667E+00	6.3600E-20	5666.0	1.2514E+00	5.0800E-20	5716.0	2.3550E+00	9.5600E-20
5617.0	1.5396E+00	6.2500E-20	5667.0	1.2046E+00	4.8900E-20	5717.0	2.2466E+00	9.1200E-20
5618.0	1.5593E+00	6.3300E-20	5668.0	1.2391E+00	5.0300E-20	5718.0	2.2343E+00	9.0700E-20
5619.0	1.6332E+00	6.6300E-20	5669.0	1.3253E+00	5.3800E-20	5719.0	2.3082E+00	9.3700E-20
5620.0	1.6948E+00	6.8800E-20	5670.0	1.3647E+00	5.5400E-20	5720.0	2.3329E+00	9.4700E-20
5621.0	1.7022E+00	6.9100E-20	5671.0	1.3352E+00	5.4200E-20	5721.0	2.2860E+00	9.2800E-20
5622.0	1.6874E+00	6.8500E-20	5672.0	1.2933E+00	5.2500E-20	5722.0	2.2737E+00	9.2300E-20
5623.0	1.6751E+00	6.8000E-20	5673.0	1.2588E+00	5.1100E-20	5723.0	2.3402E+00	9.5000E-20
5624.0	1.6579E+00	6.7300E-20	5674.0	1.2465E+00	5.0600E-20	5724.0	2.4117E+00	9.7900E-20
5625.0	1.6357E+00	6.6400E-20	5675.0	1.3376E+00	5.4300E-20	5725.0	2.3920E+00	9.7100E-20
5626.0	1.6283E+00	6.6100E-20	5676.0	1.5544E+00	6.3100E-20	5726.0	2.2639E+00	9.1900E-20
5627.0	1.6653E+00	6.7600E-20	5677.0	1.7195E+00	6.9800E-20	5727.0	2.0988E+00	8.5200E-20
5628.0	1.7635E+00	7.2400E-20	5678.0	1.7416E+00	7.0700E-20	5728.0	1.9781E+00	8.0300E-20
5629.0	1.9141E+00	7.7700E-20	5679.0	1.7367E+00	7.0500E-20	5729.0	1.8993E+00	7.7100E-20
5630.0	1.9781E+00	8.0300E-20	5680.0	1.7761E+00	7.2100E-20	5730.0	1.7761E+00	7.2100E-20
5631.0	2.0397E+00	8.2800E-20	5681.0	1.8254E+00	7.4100E-20	5731.0	1.6579E+00	6.7300E-20
5632.0	2.1161E+00	8.5900E-20	5682.0	1.8525E+00	7.5200E-20	5732.0	1.6628E+00	6.7500E-20
5633.0	2.1161E+00	8.5900E-20	5683.0	1.8944E+00	7.6900E-20	5733.0	1.7293E+00	7.0200E-20
5634.0	2.0791E+00	8.4400E-20	5684.0	2.0175E+00	8.1900E-20	5734.0	1.7663E+00	7.1700E-20
5635.0	2.1456E+00	8.7100E-20	5685.0	2.1161E+00	8.5900E-20	5735.0	1.7318E+00	7.0300E-20
5636.0	2.3329E+00	9.4700E-20	5686.0	2.0865E+00	8.4700E-20	5736.0	1.6234E+00	6.5900E-20
5637.0	2.5447E+00	1.0330E-19	5687.0	1.9855E+00	8.0600E-20	5737.0	1.4953E+00	6.0700E-20
5638.0	2.7418E+00	1.1130E-19	5688.0	1.9018E+00	7.7200E-20	5738.0	1.4239E+00	5.7800E-20
5639.0	2.9758E+00	1.2080E-19	5689.0	1.8155E+00	7.3700E-20	5739.0	1.4041E+00	5.7000E-20

Table IV. NO2 GRAHAM AND JOHNSTON DATA AT 25C

WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)
5740.0	1.3992E+00	5.6800E-20	5790.0	1.3204E+00	5.3600E-20	5840.0	8.1539E-01	3.3100E-20
5741.0	1.3770E+00	5.5900E-20	5791.0	1.3598E+00	5.5200E-20	5841.0	8.7697E-01	3.5600E-20
5742.0	1.3031E+00	5.2900E-20	5792.0	1.3647E+00	5.5400E-20	5842.0	9.4102E-01	3.8200E-20
5743.0	1.2194E+00	4.9500E-20	5793.0	1.3869E+00	5.6300E-20	5843.0	9.3856E-01	3.8100E-20
5744.0	1.1677E+00	4.7400E-20	5794.0	1.4091E+00	5.7200E-20	5844.0	9.3363E-01	3.7900E-20
5745.0	1.1529E+00	4.6800E-20	5795.0	1.3647E+00	5.5400E-20	5845.0	9.7797E-01	3.9700E-20
5746.0	1.1627E+00	4.7200E-20	5796.0	1.3081E+00	5.3100E-20	5846.0	1.0199E+00	4.1400E-20
5747.0	1.1480E+00	4.6600E-20	5797.0	1.2859E+00	5.2200E-20	5847.0	1.0568E+00	4.2900E-20
5748.0	1.1085E+00	4.5000E-20	5798.0	1.2687E+00	5.1500E-20	5848.0	1.1209E+00	4.5500E-20
5749.0	1.0617E+00	4.3100E-20	5799.0	1.2711E+00	5.1600E-20	5849.0	1.2169E+00	4.9400E-20
5750.0	1.0322E+00	4.1900E-20	5800.0	1.2810E+00	5.2000E-20	5850.0	1.3007E+00	5.2800E-20
5751.0	1.0617E+00	4.3100E-20	5801.0	1.2908E+00	5.2400E-20	5851.0	1.3007E+00	5.2800E-20
5752.0	1.1282E+00	4.5800E-20	5802.0	1.3155E+00	5.3400E-20	5852.0	1.2933E+00	5.2500E-20
5753.0	1.1480E+00	4.6600E-20	5803.0	1.3130E+00	5.3300E-20	5853.0	1.3352E+00	5.4200E-20
5754.0	1.0839E+00	4.4000E-20	5804.0	1.2514E+00	5.0800E-20	5854.0	1.3672E+00	5.5500E-20
5755.0	1.0075E+00	4.0900E-20	5805.0	1.2095E+00	4.9100E-20	5855.0	1.3647E+00	5.5400E-20
5756.0	1.0026E+00	4.0700E-20	5806.0	1.2416E+00	5.0400E-20	5856.0	1.3598E+00	5.5200E-20
5757.0	1.0248E+00	4.1600E-20	5807.0	1.2613E+00	5.1200E-20	5857.0	1.4386E+00	5.8400E-20
5758.0	9.9276E-01	4.0300E-20	5808.0	1.2317E+00	5.0000E-20	5858.0	1.5593E+00	6.3300E-20
5759.0	9.2871E-01	3.7700E-20	5809.0	1.1775E+00	4.7800E-20	5859.0	1.5618E+00	6.3400E-20
5760.0	8.7697E-01	3.5600E-20	5810.0	1.1110E+00	4.5100E-20	5860.0	1.4534E+00	5.9000E-20
5761.0	8.2771E-01	3.3600E-20	5811.0	1.0494E+00	4.2600E-20	5861.0	1.3327E+00	5.4100E-20
5762.0	7.8829E-01	3.2000E-20	5812.0	9.9276E-01	4.0300E-20	5862.0	1.2580E+00	5.1100E-20
5763.0	7.5380E-01	3.0600E-20	5813.0	9.3117E-01	3.7800E-20	5863.0	1.2317E+00	5.0000E-20
5764.0	7.2178E-01	2.9300E-20	5814.0	8.8190E-01	3.5800E-20	5864.0	1.2219E+00	4.9600E-20
5765.0	7.2671E-01	2.9500E-20	5815.0	8.4249E-01	3.4200E-20	5865.0	1.2317E+00	5.0000E-20
5766.0	7.4149E-01	3.0100E-20	5816.0	8.0554E-01	3.2700E-20	5866.0	1.2490E+00	5.0700E-20
5767.0	7.2671E-01	2.9500E-20	5817.0	7.9322E-01	3.2200E-20	5867.0	1.2391E+00	5.0300E-20
5768.0	7.0700E-01	2.8700E-20	5818.0	7.9322E-01	3.2200E-20	5868.0	1.2071E+00	4.9000E-20
5769.0	7.0207E-01	2.8500E-20	5819.0	8.0800E-01	3.2800E-20	5869.0	1.2046E+00	4.8900E-20
5770.0	6.8976E-01	2.8000E-20	5820.0	8.4002E-01	3.4100E-20	5870.0	1.2292E+00	4.9900E-20
5771.0	6.7990E-01	2.7600E-20	5821.0	8.5460E-01	3.4700E-20	5871.0	1.2219E+00	4.9600E-20
5772.0	7.0207E-01	2.8500E-20	5822.0	8.3017E-01	3.3700E-20	5872.0	1.2046E+00	4.8900E-20
5773.0	7.3902E-01	3.0000E-20	5823.0	7.9568E-01	3.2300E-20	5873.0	1.2021E+00	4.8800E-20
5774.0	7.7105E-01	3.1300E-20	5824.0	7.8337E-01	3.1800E-20	5874.0	1.1652E+00	4.7300E-20
5775.0	7.7844E-01	3.1600E-20	5825.0	7.5873E-01	3.0800E-20	5875.0	1.0888E+00	4.4200E-20
5776.0	7.4888E-01	3.0400E-20	5826.0	7.2178E-01	2.9300E-20	5876.0	1.0396E+00	4.2200E-20
5777.0	7.1193E-01	2.8900E-20	5827.0	7.0207E-01	2.8500E-20	5877.0	1.0396E+00	4.2200E-20
5778.0	7.0700E-01	2.8700E-20	5828.0	6.9961E-01	2.8400E-20	5878.0	1.0396E+00	4.2200E-20
5779.0	7.5134E-01	3.0500E-20	5829.0	7.1193E-01	2.8900E-20	5879.0	1.0051E+00	4.0800E-20
5780.0	8.2771E-01	3.3600E-20	5830.0	7.3410E-01	2.9800E-20	5880.0	9.6073E-01	3.9000E-20
5781.0	8.8929E-01	3.6100E-20	5831.0	7.7105E-01	3.1300E-20	5881.0	9.4102E-01	3.8200E-20
5782.0	9.0900E-01	3.6900E-20	5832.0	8.1539E-01	3.3100E-20	5882.0	9.2871E-01	3.7700E-20
5783.0	8.9176E-01	3.6200E-20	5833.0	8.5973E-01	3.4900E-20	5883.0	8.9668E-01	3.6400E-20
5784.0	8.7451E-01	3.5500E-20	5834.0	8.8190E-01	3.5800E-20	5884.0	8.8437E-01	3.5900E-20
5785.0	8.9422E-01	3.6300E-20	5835.0	8.6958E-01	3.5300E-20	5885.0	9.0407E-01	3.6700E-20
5786.0	9.6566E-01	3.9200E-20	5836.0	8.4249E-01	3.4200E-20	5886.0	9.1393E-01	3.7100E-20
5787.0	1.0519E+00	4.2700E-20	5837.0	8.1785E-01	3.3200E-20	5887.0	9.0654E-01	3.6800E-20
5788.0	1.1356E+00	4.6100E-20	5838.0	8.0800E-01	3.2800E-20	5888.0	9.0161E-01	3.6600E-20
5789.0	1.2366E+00	5.0200E-20	5839.0	8.0554E-01	3.2700E-20	5889.0	9.0161E-01	3.6600E-20

Table IV. NO2 GRAHAM AND JOHNSTON DATA AT 25C

WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)
5890.0	9.0161E-01	3.6600E-20
5891.0	9.2378E-01	3.7500E-20
5892.0	9.7305E-01	3.9500E-20
5893.0	9.8537E-01	4.0000E-20
5894.0	9.8290E-01	3.9900E-20
5895.0	1.0765E+00	4.3700E-20
5896.0	1.1972E+00	4.8600E-20
5897.0	1.2243E+00	4.9700E-20
5898.0	1.2095E+00	4.9100E-20
5899.0	1.2095E+00	4.9100E-20
5900.0	1.2120E+00	4.9200E-20
5901.0	1.2169E+00	4.9400E-20
5902.0	1.2514E+00	5.0800E-20
5903.0	1.2834E+00	5.2100E-20
5904.0	1.3007E+00	5.2800E-20
5905.0	1.3672E+00	5.5500E-20
5906.0	1.4978E+00	6.0800E-20
5907.0	1.5988E+00	6.4900E-20
5908.0	1.5988E+00	6.4900E-20
5909.0	1.5249E+00	6.1900E-20
5910.0	1.4583E+00	5.9200E-20
5911.0	1.4337E+00	5.8200E-20
5912.0	1.4066E+00	5.7100E-20
5913.0	1.3327E+00	5.4100E-20
5914.0	1.2391E+00	5.0300E-20
5915.0	1.2194E+00	4.9500E-20
5916.0	1.3204E+00	5.3600E-20
5917.0	1.4583E+00	5.9200E-20
5918.0	1.5544E+00	6.3100E-20
5919.0	1.6283E+00	6.6100E-20
5920.0	1.7096E+00	6.9400E-20
5921.0	1.7392E+00	7.0600E-20
5922.0	1.7096E+00	6.9400E-20
5923.0	1.7293E+00	7.0200E-20
5924.0	1.8229E+00	7.4000E-20
5925.0	1.9190E+00	7.7900E-20
5926.0	1.9165E+00	7.7800E-20
5927.0	1.7884E+00	7.2600E-20
5928.0	1.6628E+00	6.7500E-20
5929.0	1.6308E+00	6.6200E-20
5930.0	1.6874E+00	6.8500E-20
5931.0	1.8106E+00	7.3500E-20
5932.0	1.9239E+00	7.8100E-20
5933.0	1.9486E+00	7.9100E-20
5934.0	1.8426E+00	7.4800E-20
5935.0	1.6234E+00	6.5900E-20
5936.0	1.4041E+00	5.7000E-20
5937.0	1.3229E+00	5.3700E-20
5938.0	1.3524E+00	5.4900E-20
5939.0	1.3795E+00	5.6000E-20
5940.0	1.3475E+00	5.4700E-20
5941.0	1.2465E+00	5.0600E-20
5942.0	1.1159E+00	4.5300E-20
5943.0	9.9768E-01	4.0500E-20
5944.0	9.1393E-01	3.7100E-20
5945.0	8.7697E-01	3.5600E-20
5946.0	8.6958E-01	3.5300E-20
5947.0	8.6466E-01	3.5100E-20
5948.0	8.7451E-01	3.5500E-20
5949.0	8.8683E-01	3.6000E-20
5950.0	8.4495E-01	3.4300E-20
5951.0	7.9076E-01	3.2100E-20
5952.0	7.6612E-01	3.1100E-20
5953.0	7.3902E-01	3.0000E-20
5954.0	7.0700E-01	2.8700E-20
5955.0	6.7744E-01	2.7500E-20
5956.0	6.3802E-01	2.5900E-20
5957.0	6.1093E-01	2.4800E-20
5958.0	5.9615E-01	2.4200E-20
5959.0	5.8629E-01	2.3800E-20
5960.0	5.8383E-01	2.3700E-20
5961.0	5.7644E-01	2.3400E-20
5962.0	5.6905E-01	2.3100E-20
5963.0	5.9615E-01	2.4200E-20
5964.0	6.5034E-01	2.6400E-20
5965.0	7.2178E-01	2.9300E-20
5966.0	7.5873E-01	3.0800E-20
5967.0	7.2178E-01	2.9300E-20
5968.0	6.7005E-01	2.7200E-20
5969.0	6.4788E-01	2.6300E-20
5970.0	6.3556E-01	2.5800E-20
5971.0	6.3556E-01	2.5800E-20
5972.0	6.6019E-01	2.6800E-20
5973.0	6.8237E-01	2.7700E-20
5974.0	6.9468E-01	2.8200E-20
5975.0	7.1439E-01	2.9000E-20
5976.0	7.3163E-01	2.9700E-20
5977.0	7.1932E-01	2.9200E-20
5978.0	7.1439E-01	2.9000E-20
5979.0	7.4395E-01	3.0200E-20
5980.0	7.7644E-01	3.1600E-20
5981.0	7.8337E-01	3.1800E-20
5982.0	7.4888E-01	3.0400E-20
5983.0	7.0700E-01	2.8700E-20
5984.0	6.8976E-01	2.8000E-20
5985.0	6.9715E-01	2.8300E-20
5986.0	7.2178E-01	2.9300E-20
5987.0	7.6366E-01	3.1000E-20
5988.0	8.1046E-01	3.2900E-20
5989.0	8.2771E-01	3.3600E-20
5990.0	8.4986E-01	3.4500E-20
5991.0	8.8929E-01	3.6100E-20
5992.0	9.1393E-01	3.7100E-20
5993.0	9.1393E-01	3.7100E-20
5994.0	9.0407E-01	3.6700E-20
5995.0	8.8190E-01	3.5800E-20
5996.0	8.5973E-01	3.4900E-20
5997.0	8.6466E-01	3.5100E-20
5998.0	9.2132E-01	3.7400E-20
5999.0	1.0001E+00	4.0600E-20
6000.0	1.0420E+00	4.2300E-20
6001.0	1.0740E+00	4.3600E-20
6002.0	1.1085E+00	4.5000E-20
6003.0	1.0987E+00	4.4600E-20
6004.0	1.0568E+00	4.2900E-20
6005.0	1.0420E+00	4.2300E-20
6006.0	1.0667E+00	4.3300E-20
6007.0	1.1085E+00	4.5000E-20
6008.0	1.1209E+00	4.5500E-20
6009.0	1.0987E+00	4.4600E-20
6010.0	1.0864E+00	4.4100E-20
6011.0	1.0765E+00	4.3700E-20
6012.0	1.0371E+00	4.2100E-20
6013.0	9.9276E-01	4.0300E-20
6014.0	9.8044E-01	3.9800E-20
6015.0	1.0001E+00	4.0600E-20
6016.0	1.0420E+00	4.2300E-20
6017.0	1.0667E+00	4.3300E-20
6018.0	1.0346E+00	4.2000E-20
6019.0	9.8537E-01	4.0000E-20
6020.0	9.3610E-01	3.8000E-20
6021.0	9.1393E-01	3.7100E-20
6022.0	9.4102E-01	3.8200E-20
6023.0	9.6566E-01	3.9200E-20
6024.0	9.6566E-01	3.9200E-20

Table V. O3 VIGROUX AND AFCRL DATA AT +18C, -44C, -59C, -30C

WVLGTH (A)	K(CM-1 ATM-1) BASE E +18C		-44C		-59C		-30C	SOURCE		SEQ
2305.0	.12595E+03	*	.12217E+03	*	.12217E+03	*	.12343E+03	VIGROUX69	1	1
2318.0	.13839E+03	*	.13423E+03	*	.13423E+03	*	.13562E+03	VIGROUX69	2	2
2327.0	.14829E+03	*	.14384E+03	*	.14384E+03	*	.14532E+03	VIGROUX69	3	3
2333.0	.15289E+03	*	.14831E+03	*	.14831E+03	*	.14983E+03	VIGROUX69	4	4
2344.0	.16694E+03	*	.16193E+03	*	.16193E+03	*	.16360E+03	VIGROUX69	5	5
2348.0	.17016E+03	*	.16506E+03	*	.16506E+03	*	.16676E+03	VIGROUX69	6	6
2358.0	.17776E+03	*	.17243E+03	*	.17243E+03	*	.17421E+03	VIGROUX69	7	7
2364.0	.18444E+03	*	.17891E+03	*	.17891E+03	*	.18075E+03	VIGROUX69	8	8
2371.0	.19204E+03	*	.18628E+03	*	.18628E+03	*	.18820E+03	VIGROUX69	9	9
2378.0	.19457E+03	*	.18873E+03	*	.18873E+03	*	.19068E+03	VIGROUX69	10	10
2383.0	.20401E+03	*	.19789E+03	*	.19789E+03	*	.19993E+03	VIGROUX69	11	11
2389.0	.20401E+03	*	.19789E+03	*	.19789E+03	*	.19993E+03	VIGROUX69	12	12
2399.0	.22197E+03	*	.21531E+03	*	.21531E+03	*	.21753E+03	VIGROUX69	13	13
2404.0	.21944E+03	*	.21285E+03	*	.21285E+03	*	.21505E+03	VIGROUX69	14	14
2417.0	.23694E+03	*	.22983E+03	*	.22983E+03	*	.23220E+03	VIGROUX69	15	15
2419.0	.23510E+03	*	.22804E+03	*	.22804E+03	*	.23039E+03	VIGROUX69	16	16
2440.0	.25812E+03	*	.25038E+03	*	.25038E+03	*	.25296E+03	VIGROUX69	17	17
2446.0	.25605E+03		.24837E+03		.24837E+03		.25093E+03	VIGROUX53-69	18	18
2459.0	.27401E+03		.26579E+03		.26853E+03		.26853E+03	VIGROUX53-69	19	19
2466.0	.27033E+03		.26222E+03		.26492E+03		.26492E+03	VIGROUX53-69	20	20
2478.0	.28437E+03		.27584E+03		.27868E+03		.27868E+03	VIGROUX53-69	21	21
2482.0	.27931E+03		.27093E+03		.27093E+03		.27372E+03	VIGROUX53-69	22	22
2490.0	.29404E+03		.28522E+03		.28816E+03		.28816E+03	VIGROUX53-69	23	23
2495.0	.28921E+03		.28053E+03		.28053E+03		.28342E+03	VIGROUX53-69	24	24
2500.0	.29704E+03		.29109E+03		.29109E+03		.29109E+03	VIGROUX53-69	25	25
2508.0	.29013E+03		.28142E+03		.28142E+03		.28433E+03	VIGROUX53-69	26	26
2519.0	.30625E+03		.29706E+03		.30012E+03		.30012E+03	VIGROUX53-69	27	27
2529.0	.29611E+03		.28723E+03		.28723E+03		.29019E+03	VIGROUX53-69	28	28
2539.0	.30625E+03		.29706E+03		.29706E+03		.30012E+03	VIGROUX53-69	29	29
2546.0	.29657E+03		.28471E+03		.28471E+03		.28768E+03	VIGROUX53-69	30	30
2553.0	.31039E+03		.30108E+03		.30418E+03		.30418E+03	VIGROUX53-69	31	31
2566.0	.29335E+03		.28162E+03		.28455E+03		.28455E+03	VIGROUX53-69	32	32
2572.0	.29934E+03		.29036E+03		.29036E+03		.29335E+03	VIGROUX53-69	33	33
2579.0	.29174E+03		.28299E+03		.28299E+03		.28299E+03	VIGROUX53-69	34	34
2587.0	.30509E+03		.29899E+03		.29289E+03		.29899E+03	VIGROUX53-69	35	35
2598.0	.27954E+03		.27115E+03		.27115E+03		.27115E+03	VIGROUX53-69	36	36
2606.0	.29381E+03		.28500E+03		.28794E+03		.28794E+03	VIGROUX53-69	37	37
2617.0	.27332E+03		.26512E+03		.26512E+03		.26512E+03	VIGROUX53-69	38	38
2624.0	.28046E+03		.27204E+03		.27204E+03		.27485E+03	VIGROUX53-69	39	39
2635.0	.25789E+03		.24758E+03		.24758E+03		.25015E+03	VIGROUX53-69	40	40
2643.0	.26572E+03		.25775E+03		.25775E+03		.26041E+03	VIGROUX53-69	41	41
2652.0	.24891E+03		.24144E+03		.24144E+03		.24144E+03	VIGROUX53-69	42	42
2656.0	.25375E+03		.24613E+03		.24613E+03		.24867E+03	VIGROUX53-69	43	43
2671.0	.22727E+03		.22045E+03		.21818E+03		.22045E+03	VIGROUX53-69	44	44
2676.0	.23487E+03		.23017E+03		.22782E+03		.23017E+03	VIGROUX53-69	45	45
2693.0	.20792E+03		.19961E+03		.19961E+03		.20169E+03	VIGROUX53-69	46	46
2697.0	.21460E+03		.20816E+03		.20816E+03		.21031E+03	VIGROUX53-69	47	47
2702.0	.20470E+03	*	.19856E+03	*	.19856E+03	*	.20061E+03	VIGROUX69	48	48
2710.0	.19342E+03		.18955E+03		.18762E+03		.18955E+03	VIGROUX53	49	49
2715.0	.18858E+03	*	.18481E+03	*	.18481E+03	*	.18481E+03	VIGROUX53	50	50

Table V. O3 VIGROUX AND AFCRL DATA AT +18C, -44C, -59C, -30C

WVLGTH (A)	K(CM-1 ATM-1) BASE E +18C		-44C		-59C		-30C		SOURCE		SEQ
2717.0	.18766E+03		.18391E+03		.18391E+03		.18391E+03		VIGROUX53	51	51
2722.0	.18352E+03	*	.17985E+03	*	.17985E+03	*	.17985E+03		VIGROUX53	52	52
2725.0	.18075E+03	*	.17533E+03	*	.17533E+03	*	.17714E+03		VIGROUX53	53	53
2728.0	.17799E+03	*	.17265E+03	*	.17265E+03	*	.17443E+03		VIGROUX53	54	54
2731.0	.17500E+03		.16975E+03		.16975E+03		.17150E+03		VIGROUX53	55	55
2736.0	.16625E+03		.15960E+03		.16126E+03		.16292E+03		VIGROUX53	56	56
2748.0	.15842E+03		.15367E+03		.15367E+03		.15525E+03		VIGROUX53	57	57
2752.0	.15289E+03	*	.14831E+03	*	.14831E+03	*	.14983E+03		VIGROUX53	58	58
2754.0	* .15059E+03		.14457E+03		.14457E+03		.14758E+03		VIGROUX53	59	59
2756.0	.14806E+03	*	.14213E+03	*	.14213E+03	*	.14362E+03		VIGROUX53	60	60
2759.0	.14622E+03		.14037E+03		.14037E+03		.14183E+03		VIGROUX53	61	61
2763.0	.14299E+03	*	.13727E+03	*	.13727E+03	*	.14013E+03		VIGROUX53	62	62
2773.0	.13263E+03		.12732E+03		.12732E+03		.12998E+03		VIGROUX53	63	63
2782.0	.12181E+03	*	.11694E+03	*	.11694E+03	*	.11937E+03		VIGROUX53	64	64
2784.0	.12066E+03		.11583E+03		.11583E+03		.11704E+03		VIGROUX53	65	65
2792.0	.11191E+03	*	.10743E+03	*	.10743E+03	*	.10967E+03		VIGROUX53	66	66
2799.0	.10615E+03		.10190E+03		.10190E+03		.10403E+03		VIGROUX53	67	67
2809.0	.96710E+02		.92840E+02		.92840E+02		.93810E+02		VIGROUX53	68	68
2823.0	.86810E+02		.82470E+02		.82470E+02		.84200E+02		VIGROUX53	69	69
2833.0	.81510E+02		.78250E+02		.77440E+02		.79070E+02		VIGROUX53	70	70
2841.0	.72990E+02		.69340E+02		.68610E+02		.70800E+02		VIGROUX53	71	71
2845.0	.71150E+02		.67590E+02		.66880E+02		.69020E+02		VIGROUX53	72	72
2850.0	.67240E+02	*	.63870E+02	*	.63200E+02	*	.65220E+02		VIGROUX53	73	73
2859.0	.61710E+02		.58010E+02		.57390E+02		.59860E+02		VIGROUX53	74	74
2864.0	.58950E+02		.54820E+02		.54230E+02		.56590E+02		VIGROUX53	75	75
2884.0	.46050E+02		.42830E+02		.42370E+02		.44210E+02		VIGROUX53	76	76
2892.0	.42830E+02		.39400E+02		.39400E+02		.40690E+02		VIGROUX53	77	77
2897.0	.40300E+02		.37470E+02		.37070E+02		.38680E+02		VIGROUX53	78	78
2906.0	.35690E+02		.33550E+02		.33550E+02		.34260E+02		VIGROUX53	79	79
2908.0	.33620E+02	*	.31260E+02	*	.31260E+02	*	.31940E+02		VIGROUX53	80	80
2914.0	.30620E+02		.28480E+02		.28480E+02		.29090E+02		VIGROUX53	81	81
2918.0	.28550E+02		.26550E+02		.26270E+02		.27120E+02		VIGROUX53	82	82
2926.0	.26020E+02		.24460E+02		.23680E+02		.24980E+02		VIGROUX53	83	83
2931.0	.24640E+02		.22910E+02		.22670E+02		.23650E+02		VIGROUX53	84	84
2937.0	.22730E+02	*	.21140E+02	*	.20910E+02	*	.21820E+02		VIGROUX53	85	85
2941.0	.21870E+02	*	.20340E+02	*	.20120E+02	*	.21000E+02		VIGROUX53	86	86
2946.0	.20490E+02		.19060E+02		.18850E+02		.19670E+02		VIGROUX53	87	87
2948.0	.20170E+02	*	.18760E+02	*	.18560E+02	*	.19360E+02		VIGROUX53	88	88
2959.0	.18100E+02		.17010E+02		.16650E+02		.17370E+02		VIGROUX53	89	89
2967.0	.15840E+02		.14890E+02		.14730E+02		.15210E+02		VIGROUX53	90	90
2973.0	.14530E+02		.13660E+02		.13510E+02		.13800E+02		VIGROUX53	91	91
2977.0	.13470E+02		.12660E+02		.12530E+02		.12930E+02		VIGROUX53	92	92
2982.0	.12660E+02		.11900E+02		.11780E+02		.12160E+02		VIGROUX53	93	93
2987.0	.11930E+02		.11210E+02		.11090E+02	*	.11330E+02		AFCRL65-VIGROUX 53	1	94
2998.0	.10340E+02		.95100E+01		.94100E+01	*	.97200E+01		AFCRL65-VIGROUX 53	2	95
3004.0	.96500E+01		.88800E+01		.87800E+01	*	.90700E+01		AFCRL65-VIGROUX 53	3	96
3016.0	.81700E+01		.75200E+01		.74300E+01	*	.76800E+01		AFCRL65-VIGROUX 53	4	97
3021.0	.75800E+01		.69700E+01		.68200E+01	*	.71300E+01		AFCRL65-VIGROUX 53	5	98
3029.0	.67000E+01		.61600E+01		.60300E+01	*	.63000E+01		AFCRL65-VIGROUX 53	6	99
3036.0	.63100E+01		.58000E+01		.56800E+01	*	.59300E+01		AFCRL65-VIGROUX 53	7	100
3037.0	.63600E+01		.59100E+01		.57900E+01	*	.59100E+01		AFCRL65-VIGROUX 53	8	101
3042.3	.58900E+01	*	.54200E+01	*	.53000E+01	*	.54800E+01		VIGROUX67	2	102
3043.6	.57300E+01	*	.52700E+01	*	.51600E+01	*	.53300E+01		VIGROUX67	3	103
3044.9	.56070E+01	*	.51600E+01	*	.50500E+01	*	.52100E+01		VIGROUX67	4	104
3046.2	.54600E+01	*	.50200E+01	*	.49100E+01	*	.50800E+01		VIGROUX67	5	105

Table V. O3 VIGROUX AND AFCRL DATA AT +18C, -44C, -59C, -30C

WVLGTH (A)	K(CM-1 ATM-1) BASE E +18C	-44C	-59C	-30C	SOURCE	SEQ
3048.9	.50900E+01	* .46800E+01	* .45800E+01	* .47300E+01	VIGROUX67 6	106
3051.0	.47400E+01	.43100E+01	.42200E+01	* .43600E+01	AFCRL65-VIGROUX 53 9	107
3053.0	.48100E+01	.44200E+01	.43300E+01	* .44300E+01	AFCRL65-VIGROUX 53 10	108
3059.0	.45400E+01	.41300E+01	.40900E+01	* .41800E+01	AFCRL65-VIGROUX 53 11	109
3061.0	.46300E+01	.43000E+01	.42100E+01	* .42600E+01	AFCRL65-VIGROUX 53 12	110
3066.0	.43700E+01	.40600E+01	.39300E+01	* .40200E+01	AFCRL65-VIGROUX 53 13	111
3075.0	.36600E+01	.33300E+01	.32600E+01	* .33700E+01	AFCRL65-VIGROUX 53 14	112
3077.0	.37300E+01	.33900E+01	.33200E+01	* .33900E+01	AFCRL65-VIGROUX 53 15	113
3083.0	.33600E+01	.30600E+01	.29900E+01	* .30600E+01	AFCRL65-VIGROUX 53 16	114
3085.0	.33400E+01	.30400E+01	.30100E+01	* .30400E+01	AFCRL65-VIGROUX 53 17	115
3089.9	.32500E+01	* .29300E+01	* .28900E+01	* .29600E+01	VIGROUX67 15	116
3092.0	.31100E+01	.28000E+01	.27400E+01	* .28300E+01	AFCRL65-VIGROUX 53 18	117
3094.7	.28200E+01	* .25400E+01	* .24800E+01	* .25700E+01	VIGROUX67 17	118
3095.4	.28800E+01	* .25900E+01	* .25300E+01	* .25900E+01	VIGROUX67 18	119
3098.0	.26700E+01	.24000E+01	.23500E+01	* .24000E+01	AFCRL65-VIGROUX 53 19	120
3100.0	.27400E+01	.24900E+01	.24100E+01	* .24700E+01	AFCRL65-VIGROUX 53 20	121
3100.2	.25300E+01	* .22800E+01	* .22300E+01	* .22800E+01	VIGROUX67 20	122
3102.0	.26020E+01	* .23400E+01	* .22900E+01	* .23400E+01	VIGROUX67 21	123
3104.0	.25600E+01	.23000E+01	.22500E+01	* .23000E+01	AFCRL65-VIGROUX 53 21	124
3104.5	.23900E+01	* .20700E+01	* .21000E+01	* .21300E+01	VIGROUX67 22	125
3106.0	.25800E+01	.23500E+01	.22700E+01	* .23000E+01	AFCRL65-VIGROUX 53 22	126
3106.7	.24600E+01	* .22100E+01	* .21600E+01	* .21900E+01	VIGROUX67 23	127
3107.2	.23300E+01	* .21000E+01	* .20500E+01	* .20700E+01	VIGROUX67 24	128
3109.0	.23500E+01	.21200E+01	.20700E+01	* .20900E+01	AFCRL65-VIGROUX 53 23	129
3109.5	.23900E+01	* .21500E+01	* .21000E+01	* .21300E+01	VIGROUX67 25	130
3110.3	.23030E+01	* .20700E+01	* .20300E+01	* .20300E+01	VIGROUX67 26	131
3112.0	.24200E+01	.22000E+01	.21300E+01	* .21300E+01	AFCRL65-VIGROUX 53 24	132
3113.0	.23700E+01	* .20600E+01	* .20400E+01	* .20900E+01	VIGROUX67 27	133
3119.7	.19800E+01	* .17200E+01	* .17000E+01	* .17400E+01	VIGROUX67 28	134
3120.4	.20300E+01	* .17700E+01	* .17500E+01	* .17900E+01	VIGROUX67 29	135
3121.2	.18800E+01	* .16400E+01	* .16200E+01	* .16500E+01	VIGROUX67 30	136
3121.7	.19400E+01	* .16300E+01	* .16300E+01	* .16900E+01	VIGROUX67 31	137
3124.5	.18100E+01	* .15200E+01	* .15200E+01	* .15600E+01	VIGROUX67 32	138
3125.4	.18600E+01	* .15600E+01	* .15600E+01	* .16200E+01	VIGROUX67 33	139
3126.5	.17500E+01	* .14700E+01	* .14700E+01	* .15200E+01	VIGROUX67 34	140
3127.4	.18030E+01	* .15100E+01	* .15100E+01	* .15700E+01	VIGROUX67 35	141
3130.0	.17270E+01	.14330E+01	.14000E+01	.15000E+01	AFCRL65-VIGROUX 53 25	142
3135.0	.18330E+01	.15950E+01	.15400E+01	.16300E+01	AFCRL65-VIGROUX 53 26	143
3146.0	.13420E+01	.10740E+01	.10470E+01	.11400E+01	AFCRL65-VIGROUX 53 27	144
3148.0	.14050E+01	.11380E+01	.11100E+01	.11900E+01	AFCRL65-VIGROUX 53 28	145
3151.0	.13030E+01	.10680E+01	.10290E+01	.11200E+01	AFCRL65-VIGROUX 53 29	146
3154.0	.14510E+01	.12620E+01	.12330E+01	.13100E+01	AFCRL65-VIGROUX 53 30	147
3167.0	.10360E+01	.82000E+00	.78700E+00	.87000E+00	AFCRL65-VIGROUX 53 31	148
3170.0	.11280E+01	.94800E+00	.92500E+00	.98200E+00	AFCRL65-VIGROUX 53 32	149
3173.0	.10360E+01	.86000E+00	.83900E+00	.90100E+00	AFCRL65-VIGROUX 53 33	150
3176.0	.11510E+01	.10010E+01	.99000E+00	.10400E+01	AFCRL65-VIGROUX 53 34	151
3177.7	.98100E+00	* .78500E+00	* .75500E+00	* .82400E+00	VIGROUX67 40	152
3178.4	.10200E+01	* .81600E+00	* .78500E+00	* .85700E+00	VIGROUX67 41	153
3181.8	.82700E+00	* .66200E+00	* .63700E+00	* .69500E+00	VIGROUX67 42	154
3182.3	.86800E+00	* .69400E+00	* .66800E+00	* .72900E+00	VIGROUX67 43	155
3185.0	.76900E+00	* .61500E+00	* .59200E+00	* .64600E+00	VIGROUX67 44	156
3186.2	.80600E+00	* .64500E+00	* .62100E+00	* .67700E+00	VIGROUX67 45	157
3190.0	.71400E+00	.54300E+00	.52100E+00	.57800E+00	AFCRL65-VIGROUX 53 35	158
3194.0	.88600E+00	.76200E+00	.75300E+00	.78000E+00	AFCRL65-VIGROUX 53 36	159
3199.0	.79200E+00	.66500E+00	.64900E+00	.68100E+00	AFCRL65-VIGROUX 53 37	160

Table V. O3 VIGROUX AND AFCRL DATA AT +18C, -44C, -59C, -30C

WVLGTH (A)	K(CM-1 ATM-1) BASE E +18C		-44C		-59C		-30C		SOURCE		SEQ
3200.0	.89800E+00		.78100E+00		.77200E+00		.80800E+00		AFCRL65-VIGROUX	53 38	161
3209.0	.52300E+00		.38200E+00		.35600E+00		.41300E+00		AFCRL65-VIGROUX	53 39	162
3210.0	.54800E+00		.40600E+00		.38900E+00		.43300E+00		AFCRL65-VIGROUX	53 40	163
3216.0	.49700E+00		.37300E+00		.36300E+00		.39800E+00		AFCRL65-VIGROUX	53 41	164
3220.0	.69100E+00		.60800E+00		.62200E+00		.62900E+00		AFCRL65-VIGROUX	53 42	165
3223.0	.58300E+00		.48400E+00		.47800E+00		.50700E+00		AFCRL65-VIGROUX	53 43	166
3226.0	.67500E+00		.60100E+00		.59400E+00		.61400E+00		AFCRL65-VIGROUX	53 44	167
3239.0	.32200E+00		.20900E+00		.19300E+00		.23200E+00		AFCRL65-VIGROUX	53 45	168
3242.0	.37300E+00		.27600E+00		.27200E+00		.29500E+00		AFCRL65-VIGROUX	53 46	169
3245.0	.35000E+00		.25900E+00		.25200E+00		.27600E+00		AFCRL65-VIGROUX	53 47	170
3248.0	.51600E+00		.47000E+00		.46400E+00		.47500E+00		AFCRL65-VIGROUX	53 48	171
3253.0	.39400E+00		.31900E+00		.31100E+00		.33500E+00		AFCRL65-VIGROUX	53 49	172
3255.0	.42600E+00		.35400E+00		.34500E+00		.37100E+00		AFCRL65-VIGROUX	53 50	173
3256.3	.31300E+00	*	.25400E+00	*	.24700E+00	*	.26600E+00		VIGROUX67	53	174
3258.2	.33800E+00	*	.27400E+00	*	.26700E+00	*	.28700E+00		VIGROUX67	54	175
3269.0	.21200E+00		.13100E+00		.12300E+00		.14800E+00		AFCRL65-VIGROUX	53 51	176
3272.0	.27900E+00		.22300E+00		.21800E+00		.23100E+00		AFCRL65-VIGROUX	53 52	177
3275.0	.24400E+00		.18500E+00		.18000E+00		.19800E+00		AFCRL65-VIGROUX	53 53	178
3279.0	.37300E+00		.33900E+00		.33900E+00		.34700E+00		AFCRL65-VIGROUX	53 54	179
3292.0	.14000E+00		.80000E-01		.71000E-01		.92700E-01		AFCRL65-VIGROUX	53 55	180
3295.0	.15200E+00		.93000E-01		.87000E-01		.10300E+00		AFCRL65-VIGROUX	53 56	181
3299.0	.12900E+00		.79000E-01		.74000E-01		.89000E-01		AFCRL65-VIGROUX	53 57	182
3303.0	.21600E+00	*	.16400E+00	*	.15800E+00	*	.17500E+00		VIGROUX67	68	183
3309.0	.18000E+00	*	.13700E+00	*	.13100E+00	*	.14600E+00		VIGROUX67	69	184
3312.0	.24900E+00	*	.18900E+00	*	.18200E+00	*	.20200E+00		VIGROUX67	70	185
3318.7	.12200E+00	*	.93000E-01	*	.89000E-01	*	.99000E-01		VIGROUX67	71	186
3319.2	.12600E+00	*	.96000E-01	*	.92000E-01	*	.10200E+00		VIGROUX67	72	187
3321.2	.97600E-01	*	.74000E-01	*	.71000E-01	*	.79000E-01		VIGROUX67	73	188
3322.2	.10500E+00	*	.80000E-01	*	.77000E-01	*	.85000E-01		VIGROUX67	74	189
3324.3	.85000E-01	*	.65000E-01	*	.62000E-01	*	.69000E-01		VIGROUX67	75	190
3325.0	.94400E-01	*	.72000E-01	*	.69000E-01	*	.76000E-01		VIGROUX67	76	191
3328.0	.80600E-01		.53000E-01		.49000E-01		.58800E-01		AFCRL65-VIGROUX	53 61	192
3332.0	.11500E+00		.73600E-01		.70000E-01		.80600E-01		AFCRL65-VIGROUX	53 62	193
3334.0	.10100E+00		.68000E-01		.63000E-01		.70900E-01		AFCRL65-VIGROUX	53 63	194
3338.0	.17700E+00		.15200E+00		.15400E+00		.15600E+00		AFCRL65-VIGROUX	53 64	195
3345.0	.87700E-01	*	.61000E-01	*	.55000E-01	*	.66000E-01		VIGROUX67	81	196
3345.7	.94900E-01	*	.66000E-01	*	.60000E-01	*	.71000E-01		VIGROUX67	82	197
3357.0	.46000E-01		.33000E-01		.30000E-01	*	.37000E-01		AFCRL65-VIGROUX	53 65	198
3365.0	.87000E-01		.70000E-01		.66000E-01		.70800E-01		AFCRL65-VIGROUX	53 66	199
3369.0	.69000E-01		.54000E-01		.49000E-01		.53900E-01		AFCRL65-VIGROUX	53 67	200
3372.0	.11700E+00		.10300E+00		.10200E+00		.10500E+00		AFCRL65-VIGROUX	53 68	201
3375.8	.79900E-01	*	.66000E-01	*	.62000E-01	*	.70000E-01		VIGROUX67	83	202
3376.5	.86800E-01	*	.71000E-01	*	.68000E-01	*	.76000E-01		VIGROUX67	84	203
3377.4	.67900E-01	*	.56000E-01	*	.53000E-01	*	.60000E-01		VIGROUX67	85	204
3378.0	.73200E-01	*	.60000E-01	*	.57000E-01	*	.64000E-01		VIGROUX67	86	205
3382.4	.32900E-01	*	.27000E-01	*	.26000E-01	*	.29000E-01		VIGROUX67	87	206
3384.6	.41900E-01	*	.34000E-01	*	.33000E-01	*	.37000E-01		VIGROUX67	88	207
3385.6	.38700E-01	*	.32000E-01	*	.30000E-01	*	.34000E-01		VIGROUX67	89	208
3388.6	.28600E-01	*	.23000E-01	*	.22000E-01	*	.25000E-01		VIGROUX67	90	209
3391.0	.32200E-01		.25000E-01		.23000E-01	*	.28000E-01		AFCRL65-VIGROUX	53 69	210
3395.0	.50700E-01		.44000E-01		.44000E-01	*	.45000E-01		AFCRL65-VIGROUX	53 70	211
3398.0	.39100E-01		.30000E-01		.28000E-01	*	.34000E-01		AFCRL65-VIGROUX	53 71	212
3401.0	.64500E-01		.55000E-01		.55000E-01		.57000E-01		AFCRL65-VIGROUX	53 72	213
3408.4	.27600E-01	*	.23000E-01	*	.23000E-01	*	.24000E-01		VIGROUX67	95	214
3417.0	.18000E-01	*	.15000E-01	*	.15000E-01	*	.16000E-01		AFCRL65-VIGROUX	53 73	215

Table V. 03 VIGROUX AND AFCRL DATA AT +18C, -44C, -59C, -30C

WVLGTH (A)	K(CM-1 ATM-1) BASE E +18C	-44C	-59C	-30C	SOURCE	SEQ
3421.0	.20700E-01	* .18000E-01	* .18000E-01	* .18000E-01	AFCRL65-VIGROUX 53 74	216
3426.0	.17000E-01	* .14000E-01	* .14000E-01	* .15000E-01	AFCRL65-VIGROUX 53 75	217
3430.0	.25000E-01	* .21000E-01	* .21000E-01	* .22000E-01	AFCRL65-VIGROUX 53 76	218
3437.0	.22000E-01	* .19000E-01	* .19000E-01	* .19000E-01	AFCRL65-VIGROUX 53 77	219
3439.0	.35000E-01	* .30000E-01	* .30000E-01	* .31000E-01	AFCRL65-VIGROUX 53 78	220
3451.0	.15000E-01	* .13000E-01	* .13000E-01	* .13000E-01	AFCRL65-VIGROUX 53 79	221
3455.0	.18000E-01	* .15000E-01	* .15000E-01	* .16000E-01	AFCRL65-VIGROUX 53 80	222
3460.0	.13700E-01	* .12000E-01	* .12000E-01	* .12000E-01	AFCRL65-VIGROUX 53 81	223
3463.0	.15400E-01	* .13000E-01	* .13000E-01	* .14000E-01	AFCRL65-VIGROUX 53 82	224
3466.0	.18200E-01	* .15000E-01	* .15000E-01	* .16000E-01	AFCRL65-VIGROUX 53 83	225
3472.0	.13900E-01	* .12000E-01	* .12000E-01	* .12000E-01	AFCRL65-VIGROUX 53 84	226
3481.0	.66800E-02	* .57000E-02	* .57000E-02	* .59000E-02	AFCRL65-VIGROUX 53 85	227
3485.0	.76000E-02	* .65000E-02	* .65000E-02	* .67000E-02	AFCRL65-VIGROUX 53 86	228
3489.0	.62000E-02	* .53000E-02	* .53000E-02	* .55000E-02	AFCRL65-VIGROUX 53 87	229
3493.0	.97900E-02	* .83000E-02	* .83000E-02	* .86000E-02	AFCRL65-VIGROUX 53 88	230
3499.0	.69000E-02	* .59000E-02	* .59000E-02	* .61000E-02	AFCRL65-VIGROUX 53 89	231
3501.0	.74000E-02	* .63000E-02	* .63000E-02	* .65000E-02	AFCRL65-VIGROUX 53 90	232
3506.0	.54100E-02	* .46000E-02	* .46000E-02	* .48000E-02	AFCRL65-VIGROUX 53 91	233
3514.0	.10400E-01	* .88000E-02	* .88000E-02	* .92000E-02	AFCRL65-VIGROUX 53 92	234
3521.0	.65200E-02	* .55000E-02	* .55000E-02	* .57000E-02	AFCRL65-VIGROUX 53 93	235
3523.0	.72800E-02	* .62000E-02	* .62000E-02	* .64000E-02	AFCRL65-VIGROUX 53 94	236
3546.0	.20500E-02	* .17000E-02	* .17000E-02	* .18000E-02	AFCRL65-VIGROUX 53 95	237
3550.0	.23700E-02	* .20000E-02	* .20000E-02	* .21000E-02	AFCRL65-VIGROUX 53 96	238
3554.0	.13700E-02	* .12000E-02	* .12000E-02	* .12000E-02	AFCRL65-VIGROUX 53 97	239
3556.0	.18800E-02	* .16000E-02	* .16000E-02	* .17000E-02	AFCRL65-VIGROUX 53 98	240
3561.0	.15400E-02	* .13000E-02	* .13000E-02	* .14000E-02	AFCRL65-VIGROUX 53 99	241
3567.0	.31100E-02	* .26000E-02	* .26000E-02	* .27000E-02	AFCRL65-VIGROUX 53 100	242
3572.0	.25100E-02	* .21000E-02	* .21000E-02	* .22000E-02	AFCRL65-VIGROUX 53 101	243
3573.0	.26200E-02	* .22000E-02	* .22000E-02	* .23000E-02	AFCRL65-VIGROUX 53 102	244
3588.0	.12800E-02	* .11000E-02	* .11000E-02	* .11000E-02	AFCRL65-VIGROUX 53 103	245
3594.0	.18200E-02	* .15000E-02	* .15000E-02	* .16000E-02	AFCRL65-VIGROUX 53 104	246
3599.0	.15900E-02	* .14000E-02	* .14000E-02	* .14000E-02	AFCRL65-VIGROUX 53 105	247
3600.0	.17600E-02	* .15000E-02	* .15000E-02	* .15000E-02	AFCRL65-VIGROUX 53 106	248
3604.0	.12000E-02	* .10000E-02	* .10000E-02	* .11000E-02	AFCRL65-VIGROUX 53 107	249
3606.0	.13100E-02	* .11000E-02	* .11000E-02	* .12000E-02	AFCRL65-VIGROUX 53 108	250
3639.0	.18000E-03	* .15000E-03	* .15000E-03	* .15000E-03	AFCRL65-VIGROUX 53 109	251
3647.0	.84000E-03	* .71000E-03	* .71000E-03	* .74000E-03	AFCRL65-VIGROUX 53 110	252
3650.0	.60000E-03	* .51000E-03	* .51000E-03	* .53000E-03	AFCRL65-VIGROUX 53 111	253
3654.0	.83000E-03	* .71000E-03	* .71000E-03	* .73000E-03	AFCRL65-VIGROUX 53 112	254
4069.0	.53000E-03				VIGROUX53 1	255
4084.0	.74000E-03				VIGROUX53 2	256
4094.0	.78000E-03				VIGROUX53 3	257
4108.0	.83000E-03				VIGROUX53 4	258
4122.0	.78000E-03				VIGROUX53 5	259
4134.0	.76000E-03				VIGROUX53 6	260
4145.0	.74000E-03				VIGROUX53 7	261
4165.0	.92000E-03				VIGROUX53 8	262
4171.0	.10100E-02				VIGROUX53 9	263
4184.0	.10600E-02				VIGROUX53 10	264
4197.0	.10400E-02				VIGROUX53 11	265
4205.0	.99000E-03				VIGROUX53 12	266
4221.0	.12700E-02				VIGROUX53 13	267
4237.0	.16100E-02				VIGROUX53 14	268
4260.0	.19100E-02				VIGROUX53 15	269
4270.0	.18900E-02				VIGROUX53 16	270

Table V. O3 VIGROUX AND AFCRL DATA AT +18C, -44C, -59C, -30C

WVLGTH (A)	K(CM-1 ATM-1) BASE E +18C	-44C	-59C	-30C	SOURCE	SEQ
4285.0	.17700E-02				VIGROUX53 17	271
4299.0	.16800E-02				VIGROUX53 18	272
4314.0	.19600E-02				VIGROUX53 19	273
4331.0	.22800E-02				VIGROUX53 20	274
4342.0	.16000E-02				AFCRL 57 1 VIGR53	275
4348.0	.25300E-02				VIGROUX53 21	276
4362.0	.21900E-02				VIGROUX53 22	277
4371.0	.23500E-02				VIGROUX53 23	278
4393.0	.30900E-02				VIGROUX53 24	279
4410.0	.37500E-02				VIGROUX53 25	280
4431.0	.42600E-02				VIGROUX53 26	281
4443.0	.32000E-02				AFCRL 57 2 VIGR53	282
4444.0	.41700E-02				VIGROUX53 27	283
4472.0	.36600E-02				VIGROUX53 28	284
4516.0	.53700E-02				VIGROUX53 .1	285
4543.0	.37000E-02				AFCRL 57 3 VIGR53	286
4551.0	.52000E-02				VIGROUX53 2	287
4585.0	.83100E-02				VIGROUX53 3	288
4620.0	.11470E-01				VIGROUX53 4	289
4629.0	.85000E-02				AFCRL 57 4 VIGR53	290
4644.0	.85000E-02				AFCRL 57 5 VIGR53	291
4667.0	.90700E-02				VIGROUX53 5	292
4685.0	.76000E-02				AFCRL 57 6 VIGR53	293
4710.0	.11880E-01				VIGROUX53 6	294
4731.0	.11210E-01				VIGROUX53 7	295
4746.0	.10000E-01				AFCRL 57 7 VIGR53	296
4770.0	.15310E-01				VIGROUX53 8	297
4831.0	.23950E-01				VIGROUX53 9	298
4838.0	.20000E-01				AFCRL 57 8 VIGR53	299
4874.0	.21250E-01				VIGROUX53 10	300
4883.0	.18000E-01				AFCRL 57 9 VIGR53	301
4888.0	.22100E-01				VIGROUX53 11	302
4928.0	.23030E-01				VIGROUX53 12	303
4951.0	.21000E-01				AFCRL 57 10 VIGR53	304
4969.0	.25100E-01				VIGROUX53 13	305
5012.0	.36610E-01				VIGROUX53 14	306
5055.0	.39000E-01				AFCRL 57 11 VIGR53	307
5060.0	.46280E-01				VIGROUX53 15	308
5070.0	.41000E-01				AFCRL 57 12 VIGR53	309
5106.0	.42140E-01				VIGROUX53 16	310
5118.0	.41450E-01				VIGROUX53 17	311
5123.0	.37000E-01				AFCRL 57 13 VIGR53	312
5148.0	.42630E-01				VIGROUX53 18	313
5160.0	.41000E-01				AFCRL 57 14 VIGR53	314
5196.0	.46970E-01				VIGROUX53 19	315
5245.0	.55490E-01				VIGROUX53 20	316
5265.0	.55000E-01				AFCRL 57 15 VIGR53	317
5296.0	.69080E-01				VIGROUX53 21	318
5340.0	.74830E-01				VIGROUX53 22	319
5344.0	.71000E-01				AFCRL 57 16 VIGR53	320
5365.0	.73450E-01				VIGROUX53 23	321
5371.0	.71000E-01				AFCRL 57 17 VIGR53	322
5397.0	.71000E-01				AFCRL 57 18 VIGR53	323
5405.0	.79210E-01				VIGROUX53 24	324
5461.0	.83350E-01				VIGROUX53 25	325

Table V. O3 VIGROUX AND AFCRL DATA AT +18C, -44C, -59C, -30C

WVLGTH (A)	K(CM-1 ATM-1) BASE E +18C	-44C	-59C	-30C	SOURCE	SEQ
5476.0	.81000E-01				AFCRL 57 19 VIGR53	326
5487.0	.84740E-01				VIGROUX53 26	327
5512.0	.87040E-01				VIGROUX53 27	328
5528.0	.87000E-01				AFCRL 57 20 VIGR53	329
5536.0	.88420E-01				VIGROUX53 28	330
5564.0	.93490E-01				VIGROUX53 29	331
5581.0	.92000E-01				AFCRL 57 21 VIGR53	332
5590.0	.99700E-01				VIGROUX53 30	333
5617.0	.11122E+00				VIGROUX53 31	334
5643.0	.11513E+00				VIGROUX53 32	335
5670.0	.11927E+00				VIGROUX53 33	336
5685.0	.11300E+00				AFCRL 57 22 VIGR53	337
5698.0	.12411E+00				VIGROUX53 34	338
5735.0	.12710E+00				VIGROUX53 35	339
5754.0	.12872E+00				VIGROUX53 36	340
5763.0	.12000E+00				AFCRL 57 23 VIGR53	341
5783.0	.12664E+00				VIGROUX53 37	342
5789.0	.11700E+00				AFCRL 57 24 VIGR53	343
5812.0	.12066E+00				VIGROUX53 38	344
5841.0	.11100E+00				AFCRL 57 25 VIGR53	345
5842.0	.11766E+00				VIGROUX53 39	346
5872.0	.11628E+00				VIGROUX53 40	347
5893.0	.10800E+00				AFCRL 57 26 VIGR53	348
5903.0	.11858E+00				VIGROUX53 41	349
5934.0	.12043E+00				VIGROUX53 42	350
5945.0	.11100E+00				AFCRL 57 27 VIGR53	351
5968.0	.12802E+00				VIGROUX53 43	352
5997.0	.12400E+00				AFCRL 57 28 VIGR53	353
6019.0	.13677E+00				VIGROUX53 44	354
6036.0	.13401E+00				VIGROUX53 45	355
6038.0	.12700E+00				AFCRL 57 29 VIGR53	356
6075.0	.12918E+00				VIGROUX53 46	357
6101.0	.12000E+00				AFCRL 57 30 VIGR53	358
6108.0	.12135E+00				VIGROUX53 47	359
6143.0	.11398E+00				VIGROUX53 48	360
6180.0	.10937E+00				VIGROUX53 49	361
6191.0	.10362E+00				VIGROUX53 50	362
6205.0	.10400E+00				AFCRL 57 31 VIGR53	363
6220.0	.10177E+00				VIGROUX53 51	364
6256.0	.97170E-01				VIGROUX53 52	365
6293.0	.92100E-01				VIGROUX53 53	366
6309.0	.90000E-01				AFCRL 57 32 VIGR53	367
6335.0	.87500E-01				VIGROUX53 54	368
6349.0	.84510E-01				VIGROUX53 55	369
6376.0	.81740E-01				VIGROUX53 56	370
6413.0	.76000E-01				AFCRL 57 33 VIGR53	371
6418.0	.76220E-01				VIGROUX53 57	372
6458.0	.71150E-01				VIGROUX53 58	373
6486.0	.66550E-01				VIGROUX53 59	374
6500.0	.65850E-01				VIGROUX53 60	375
6517.0	.62000E-01				AFCRL 57 34 VIGR53	376
6544.0	.61940E-01				VIGROUX53 61	377
6622.0	.53000E-01				AFCRL 57 35 VIGR53	378
6634.0	.53190E-01				VIGROUX53 62	379
6681.0	.49510E-01				VIGROUX53 63	380

Table V. O3 VIGROUX AND AFCRL DATA AT +18C, -44C, -59C, -30C

WVLGTH (A)	K(CM-1 ATM-1) BASE E				SOURCE	SEQ
	+18C	-44C	-59C	-30C		
6726.0	.41000E-01				AFCRL 57 36 VIGR53	381
6727.0	.43060E-01				VIGROUX53 64	382
6777.0	.38680E-01				VIGROUX53 65	383
6828.0	.34540E-01				VIGROUX53 66	384
6832.0	.32000E-01				AFCRL 57 37 VIGR53	385
6876.0	.31780E-01				VIGROUX53 67	386
6925.0	.29010E-01				VIGROUX53 68	387
6937.0	.25000E-01				AFCRL 57 38 VIGR53	388
6981.0	.25560E-01				VIGROUX53 69	389
7036.0	.23030E-01				VIGROUX53 70	390
7042.0	.20000E-01				AFCRL 57 39 VIGR53	391
7089.0	.21300E-01				VIGROUX53 71	392
7122.0	.20720E-01				VIGROUX53 72	393
7146.0	.17000E-01				AFCRL 57 40 VIGR53	394
7168.0	.19920E-01				VIGROUX53 73	395
7207.0	.17500E-01				VIGROUX53 74	396
7250.0	.13000E-01				AFCRL 57 41 VIGR53	397
7264.0	.15310E-01				VIGROUX53 75	398
7326.0	.13470E-01				VIGROUX53 76	399
7353.0	.11000E-01				AFCRL 57 42 VIGR53	400
7392.0	.10710E-01				VIGROUX53 77	401
7456.0	.11000E-01				AFCRL 57 43 VIGR53	402
7560.0	.87000E-02				AFCRL 57 44 VIGR53	403

* Means Estimated Values

Table VI. 03 VIGROUX DATA AT 18C

WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)
2305.0	1.2595E+02	4.6839E-18
2318.0	1.3839E+02	5.1465E-18
2327.0	1.4829E+02	5.5147E-18
2333.0	1.5289E+02	5.6858E-18
2344.0	1.6694E+02	6.2083E-18
2348.0	1.7016E+02	6.3280E-18
2358.0	1.7776E+02	6.6106E-18
2364.0	1.8444E+02	6.8591E-18
2371.0	1.9204E+02	7.1417E-18
2378.0	1.9457E+02	7.2358E-18
2383.0	2.0401E+02	7.5868E-18
2389.0	2.0401E+02	7.5868E-18
2399.0	2.2197E+02	8.2547E-18
2404.0	2.1944E+02	8.1607E-18
2417.0	2.3694E+02	8.8115E-18
2419.0	2.3510E+02	8.7430E-18
2440.0	2.5812E+02	9.5991E-18
2448.0	2.5605E+02	9.5221E-18
2459.0	2.7401E+02	1.0190E-17
2466.0	2.7033E+02	1.0053E-17
2478.0	2.8437E+02	1.0575E-17
2482.0	2.7931E+02	1.0387E-17
2490.0	2.9404E+02	1.0935E-17
2495.0	2.8921E+02	1.0755E-17
2500.0	2.9704E+02	1.1046E-17
2508.0	2.9013E+02	1.0790E-17
2519.0	3.0625E+02	1.1389E-17
2529.0	2.9611E+02	1.1012E-17
2539.0	3.0625E+02	1.1389E-17
2546.0	2.9657E+02	1.1029E-17
2553.0	3.1039E+02	1.1543E-17
2566.0	2.9335E+02	1.0909E-17
2572.0	2.9934E+02	1.1132E-17
2579.0	2.9174E+02	1.0849E-17
2587.0	3.0509E+02	1.1346E-17
2598.0	2.7954E+02	1.0396E-17
2606.0	2.9381E+02	1.0926E-17
2617.0	2.7332E+02	1.0164E-17
2624.0	2.8046E+02	1.0430E-17
2635.0	2.5789E+02	9.5906E-18
2643.0	2.6572E+02	9.8817E-18
2652.0	2.4891E+02	9.2566E-18
2656.0	2.5375E+02	9.4366E-18
2671.0	2.2727E+02	8.4518E-18
2676.0	2.3487E+02	8.7345E-18
2693.0	2.0792E+02	7.7322E-18
2697.0	2.1460E+02	7.9807E-18
2702.0	2.0470E+02	7.6125E-18
2710.0	1.9342E+02	7.1930E-18
2715.0	1.6058E+02	7.0130E-18
2717.0	1.8766E+02	6.9783E-18
2722.0	1.8352E+02	6.8243E-18
2725.0	1.8075E+02	6.7218E-18
2728.0	1.7799E+02	6.6192E-18
2731.0	1.7500E+02	6.5080E-18
2738.0	1.6025E+02	5.9586E-18
2748.0	1.5642E+02	5.8214E-18
2752.0	1.5289E+02	5.6858E-18
2754.0	1.5059E+02	5.6002E-18
2756.0	1.4806E+02	5.5061E-18
2759.0	1.4622E+02	5.4377E-18
2763.0	1.4299E+02	5.3176E-18
2773.0	1.3263E+02	4.9323E-18
2782.0	1.2181E+02	4.5299E-18
2784.0	1.2066E+02	4.4872E-18
2792.0	1.1191E+02	4.1613E-18
2799.0	1.0615E+02	3.9476E-18
2809.0	9.6710E+01	3.5965E-18
2823.0	8.6810E+01	3.2283E-18
2833.0	8.1510E+01	3.0312E-18
2841.0	7.2990E+01	2.7144E-18
2845.0	7.1150E+01	2.6461E-18
2850.0	6.7240E+01	2.5006E-18
2859.0	6.1710E+01	2.2943E-18
2864.0	5.8950E+01	2.1923E-18
2884.0	4.6050E+01	1.7125E-18
2892.0	4.2630E+01	1.5923E-18
2897.0	4.0300E+01	1.4987E-18
2906.0	3.5690E+01	1.3273E-18
2908.0	3.3620E+01	1.2503E-18
2914.0	3.0620E+01	1.1387E-18
2918.0	2.8550E+01	1.0617E-18
2926.0	2.6020E+01	9.6765E-19
2931.0	2.4640E+01	9.1633E-19
2937.0	2.2730E+01	8.4530E-19
2941.0	2.1870E+01	8.1331E-19
2946.0	2.0490E+01	7.6193E-19
2948.0	2.0170E+01	7.5009E-19
2959.0	1.8100E+01	6.7311E-19
2967.0	1.5840E+01	5.8907E-19
2973.0	1.4530E+01	5.4035E-19
2977.0	1.3470E+01	5.0093E-19
2982.0	1.2660E+01	4.7081E-19
3042.3	5.8900E+00	2.1901E-19
3043.6	5.7300E+00	2.1309E-19
3044.9	5.6070E+00	2.0852E-19
3046.2	5.4600E+00	2.0305E-19
3048.9	5.0900E+00	1.8923E-19
3089.9	3.2500E+00	1.2086E-19
3094.7	2.8200E+00	1.0487E-19

WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)
3095.4	2.8500E+00	1.0710E-19
3101.2	2.5300E+00	9.4087E-20
3102.0	2.6020E+00	9.6765E-20
3104.5	2.3900E+00	8.8881E-20
3106.7	2.4600E+00	9.1484E-20
3107.2	2.3300E+00	8.6649E-20
3109.5	2.3900E+00	8.8881E-20
3110.3	2.3030E+00	8.5645E-20
3113.0	2.3700E+00	8.8137E-20
3119.7	1.9800E+00	7.3633E-20
3120.4	2.0300E+00	7.5493E-20
3121.2	1.8600E+00	6.9914E-20
3121.7	1.9400E+00	7.2146E-20
3124.5	1.8100E+00	6.7311E-20
3125.4	1.8600E+00	6.9171E-20
3126.5	1.7500E+00	6.5083E-20
3127.4	1.8030E+00	6.7051E-20
3177.7	9.8100E-01	3.6482E-20
3178.4	1.0200E+00	3.7932E-20
3181.6	8.2700E-01	3.0755E-20
3182.3	8.6800E-01	3.2283E-20
3185.0	7.6900E-01	2.8599E-20
3186.2	8.0000E-01	2.9974E-20
3256.3	3.1300E-01	1.1640E-20
3258.2	3.3800E-01	1.2570E-20
3303.0	2.1600E-01	8.0327E-21
3309.6	1.8000E-01	6.6939E-21
3312.0	2.4900E-01	9.2599E-21
3313.7	1.2200E-01	4.5370E-21
3319.2	1.2600E-01	4.6858E-21
3321.2	9.7600E-02	3.6296E-21
3322.2	1.0500E-01	3.9048E-21
3324.3	8.5000E-02	3.1610E-21
3325.0	9.4400E-02	3.5106E-21
3345.0	8.7700E-02	3.2614E-21
3345.7	9.4900E-02	3.5292E-21
3375.0	7.9900E-02	2.9714E-21
3376.5	8.6800E-02	3.2280E-21
3377.4	6.7900E-02	2.5251E-21
3378.0	7.3200E-02	2.7222E-21
3382.4	3.2900E-02	1.2235E-21
3384.6	4.1900E-02	1.5582E-21
3385.6	3.8700E-02	1.4392E-21
3388.6	2.8600E-02	1.0636E-21
3408.4	2.7600E-02	1.0264E-21
4089.8	5.3000E-04	1.9710E-23
4084.0	7.4000E-04	2.7520E-23
4094.0	7.8000E-04	2.9017E-23

Table VI. O3 VIGROUX DATA AT 18C

WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)
4108.0	8.3000E-04	3.0866E-23	4874.0	2.1250E-02	7.9026E-22	6619.0	1.3677E-01	5.0863E-21
4122.0	7.8000E-04	2.9007E-23	4888.0	2.2100E-02	8.2187E-22	6636.0	1.3401E-01	4.9836E-21
4134.0	7.6000E-04	2.8263E-23	4928.0	2.3030E-02	8.5645E-22	6675.0	1.2916E-01	4.8040E-21
4145.0	7.4000E-04	2.7520E-23	4969.0	2.5100E-02	9.3343E-22	6708.0	1.2135E-01	4.5128E-21
4165.0	9.2000E-04	3.4213E-23	5012.0	3.6610E-02	1.3615E-21	6743.0	1.1396E-01	4.2383E-21
4171.0	1.0100E-03	3.7560E-23	5060.0	4.6280E-02	1.7211E-21	6780.0	1.0937E-01	4.0673E-21
4184.0	1.0600E-03	3.9420E-23	5106.0	4.2140E-02	1.5671E-21	6791.0	1.0362E-01	3.8535E-21
4197.0	1.0400E-03	3.8676E-23	5118.0	4.1450E-02	1.5415E-21	6820.0	1.0177E-01	3.7847E-21
4205.0	9.9000E-04	3.6817E-23	5148.0	4.2630E-02	1.5928E-21	6856.0	9.7170E-02	3.6136E-21
4221.0	1.2700E-03	4.7229E-23	5196.0	4.6970E-02	1.7467E-21	6893.0	9.2100E-02	3.4251E-21
4237.0	1.6100E-03	5.9874E-23	5245.0	5.5490E-02	2.0636E-21	6935.0	8.7500E-02	3.2540E-21
4260.0	1.9100E-03	7.1039E-23	5296.0	6.9080E-02	2.5691E-21	6949.0	8.4910E-02	3.1428E-21
4270.0	1.8900E-03	7.0286E-23	5340.0	7.4830E-02	2.7829E-21	6976.0	8.1740E-02	3.0398E-21
4285.0	1.7700E-03	6.5824E-23	5365.0	7.3450E-02	2.7315E-21	6418.0	7.6220E-02	2.8345E-21
4299.0	1.6800E-03	6.2477E-23	5405.0	7.9210E-02	2.9457E-21	6458.0	7.1150E-02	2.6461E-21
4314.0	1.9600E-03	7.2890E-23	5461.0	8.3350E-02	3.0997E-21	6486.0	6.6550E-02	2.4749E-21
4331.0	2.2800E-03	8.4790E-23	5487.0	8.4740E-02	3.1514E-21	6500.0	6.5850E-02	2.4489E-21
4348.0	2.5300E-03	9.4087E-23	5512.0	8.7040E-02	3.2369E-21	6544.0	6.1940E-02	2.3035E-21
4362.0	2.1900E-03	8.1443E-23	5538.0	8.6420E-02	3.2882E-21	6634.0	5.3190E-02	1.9761E-21
4371.0	2.3500E-03	8.7393E-23	5564.0	9.3490E-02	3.4768E-21	6681.0	4.9510E-02	1.8412E-21
4393.0	3.0900E-03	1.1491E-22	5590.0	9.9700E-02	3.7077E-21	6727.0	4.3060E-02	1.6013E-21
4410.0	3.7500E-03	1.3946E-22	5617.0	1.1122E-01	4.1361E-21	6777.0	3.8680E-02	1.4385E-21
4431.0	4.2600E-03	1.5842E-22	5643.0	1.1513E-01	4.2815E-21	6826.0	3.4540E-02	1.2845E-21
4444.0	4.1700E-03	1.5506E-22	5670.0	1.1927E-01	4.4355E-21	6876.0	3.1780E-02	1.1819E-21
4472.0	3.6600E-03	1.3611E-22	5698.0	1.2411E-01	4.6155E-21	6925.0	2.9310E-02	1.0768E-21
4516.0	5.3700E-03	1.9970E-22	5735.0	1.2710E-01	4.7267E-21	6981.0	2.5960E-02	9.5654E-22
4551.0	5.2000E-03	1.9338E-22	5754.0	1.2872E-01	4.7869E-21	7036.0	2.3330E-02	8.5645E-22
4585.0	8.3100E-03	3.0904E-22	5793.0	1.2664E-01	4.7096E-21	7089.0	2.1300E-02	7.9212E-22
4620.0	1.1470E-02	4.2655E-22	5812.0	1.2066E-01	4.4872E-21	7122.0	2.0720E-02	7.7059E-22
4667.0	9.0700E-03	3.3730E-22	5842.0	1.1766E-01	4.3756E-21	7168.0	1.9920E-02	7.4063E-22
4710.0	1.1880E-02	4.4180E-22	5872.0	1.1628E-01	4.3243E-21	7207.0	1.7500E-02	6.5060E-22
4731.0	1.1210E-02	4.1688E-22	5903.0	1.1858E-01	4.4098E-21	7264.0	1.5310E-02	5.6936E-22
4770.0	1.5310E-02	5.6936E-22	5934.0	1.2043E-01	4.4786E-21	7328.0	1.3470E-02	5.0093E-22
4831.0	2.3950E-02	8.9067E-22	5968.0	1.2802E-01	4.7609E-21	7392.0	1.0710E-02	3.9829E-22

Table VII. O3 CRAHAM AND JOHNSTON DATA AT 25C

WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)
4080.0	1.4780E-05	6.0000E-25	4280.0	1.2736E-03	5.1700E-23	4480.0	3.5646E-03	1.4470E-22
4084.0	1.4780E-05	6.0000E-25	4284.0	1.2736E-03	5.1700E-23	4484.0	3.6385E-03	1.4770E-22
4088.0	5.9122E-05	2.4000E-24	4288.0	1.1972E-03	4.8600E-23	4488.0	3.7980E-03	1.5420E-22
4092.0	1.3549E-04	5.5000E-24	4292.0	1.1972E-03	4.8600E-23	4492.0	3.9415E-03	1.6000E-22
4096.0	1.6505E-04	6.7000E-24	4296.0	1.1529E-03	4.6800E-23	4496.0	4.1213E-03	1.6730E-22
4100.0	1.7983E-04	7.3000E-24	4300.0	1.1529E-03	4.6800E-23	4500.0	4.1903E-03	1.7010E-22
4104.0	1.8722E-04	7.6000E-24	4304.0	1.1972E-03	4.8600E-23	4504.0	4.2042E-03	1.7310E-22
4108.0	1.7983E-04	7.3000E-24	4308.0	1.3105E-03	5.3200E-23	4508.0	4.3923E-03	1.7830E-22
4112.0	1.6505E-04	6.7000E-24	4312.0	1.4460E-03	5.8700E-23	4512.0	4.4612E-03	1.8110E-22
4116.0	2.1185E-04	8.6000E-24	4316.0	1.5076E-03	6.1200E-23	4516.0	4.5893E-03	1.8630E-22
4120.0	1.9707E-04	8.0000E-24	4320.0	1.5372E-03	6.2400E-23	4520.0	4.6411E-03	1.8840E-22
4124.0	2.4141E-04	9.8000E-24	4324.0	1.5815E-03	6.4200E-23	4524.0	4.6041E-03	1.8690E-22
4128.0	1.4288E-04	5.8000E-24	4328.0	1.6357E-03	6.6400E-23	4528.0	4.5815E-03	1.8600E-22
4132.0	1.2071E-04	4.9000E-24	4332.0	1.7022E-03	6.9100E-23	4532.0	4.6337E-03	1.8810E-22
4136.0	1.9707E-04	8.0000E-24	4336.0	1.6579E-03	6.7300E-23	4536.0	4.6115E-03	1.8720E-22
4140.0	1.6505E-04	6.7000E-24	4340.0	1.6357E-03	6.6400E-23	4540.0	4.5740E-03	1.8570E-22
4144.0	2.0446E-04	8.3000E-24	4344.0	1.6727E-03	6.7900E-23	4544.0	4.6411E-03	1.8840E-22
4148.0	2.6359E-04	1.0700E-23	4348.0	1.6579E-03	6.7300E-23	4548.0	4.7692E-03	1.9360E-22
4152.0	4.5327E-04	1.8400E-23	4352.0	1.6874E-03	6.8500E-23	4552.0	4.8751E-03	1.9790E-22
4156.0	5.4195E-04	2.2000E-23	4356.0	1.7490E-03	7.1000E-23	4556.0	5.0648E-03	2.0560E-22
4160.0	5.2717E-04	2.1400E-23	4360.0	1.7638E-03	7.1600E-23	4560.0	5.2003E-03	2.1110E-22
4164.0	4.8283E-04	1.9600E-23	4364.0	1.7934E-03	7.2800E-23	4564.0	5.3653E-03	2.1780E-22
4168.0	5.2224E-04	2.1200E-23	4368.0	1.8623E-03	7.5600E-23	4568.0	5.7053E-03	2.3160E-22
4172.0	5.2717E-04	2.1400E-23	4372.0	1.9215E-03	7.8000E-23	4572.0	5.9984E-03	2.4350E-22
4176.0	5.4195E-04	2.2000E-23	4376.0	2.0126E-03	8.1700E-23	4576.0	6.4961E-03	2.6370E-22
4180.0	5.8876E-04	2.3900E-23	4380.0	2.0643E-03	8.3800E-23	4580.0	6.6077E-03	2.7960E-22
4184.0	5.7151E-04	2.3200E-23	4384.0	2.1859E-03	8.8700E-23	4584.0	7.2498E-03	2.9430E-22
4188.0	5.9615E-04	2.4200E-23	4388.0	2.3353E-03	9.4800E-23	4588.0	7.8563E-03	3.1900E-22
4192.0	6.3310E-04	2.5700E-23	4392.0	2.4782E-03	1.0060E-22	4592.0	8.2136E-03	3.3340E-22
4196.0	6.6266E-04	2.6900E-23	4396.0	2.7960E-03	1.1350E-22	4596.0	8.6515E-03	3.5120E-22
4200.0	7.2424E-04	2.9400E-23	4400.0	2.9462E-03	1.1960E-22	4600.0	8.9373E-03	3.6280E-22
4204.0	7.6858E-04	3.1200E-23	4404.0	3.0891E-03	1.2540E-22	4604.0	9.2994E-03	3.7750E-22
4208.0	8.1293E-04	3.3000E-23	4408.0	3.3010E-03	1.3400E-22	4608.0	9.6985E-03	3.9370E-22
4212.0	8.2771E-04	3.3600E-23	4412.0	3.4439E-03	1.3980E-22	4612.0	9.8192E-03	3.9860E-22
4216.0	8.1293E-04	3.3000E-23	4416.0	3.7296E-03	1.5140E-22	4616.0	9.9094E-03	4.0470E-22
4220.0	8.4495E-04	3.4300E-23	4420.0	3.8725E-03	1.5720E-22	4620.0	1.0021E-02	4.0680E-22
4224.0	9.4102E-04	3.8200E-23	4424.0	4.0474E-03	1.6430E-22	4624.0	1.0021E-02	4.0680E-22
4228.0	9.8044E-04	3.9800E-23	4428.0	4.2198E-03	1.7130E-22	4628.0	1.0046E-02	4.0620E-22
4232.0	1.0248E-03	4.1600E-23	4432.0	4.2454E-03	1.7250E-22	4632.0	9.8789E-03	4.0070E-22
4236.0	1.0322E-03	4.1900E-23	4436.0	4.1903E-03	1.7010E-22	4636.0	9.6073E-03	3.9000E-22
4240.0	1.0543E-03	4.2800E-23	4440.0	4.1607E-03	1.6890E-22	4640.0	9.3955E-03	3.8140E-22
4244.0	1.1011E-03	4.4700E-23	4444.0	4.6917E-03	1.6610E-22	4644.0	9.1245E-03	3.7040E-22
4248.0	1.2514E-03	5.0800E-23	4448.0	3.8725E-03	1.5720E-22	4648.0	8.7550E-03	3.5540E-22
4252.0	1.3327E-03	5.4100E-23	4452.0	3.7370E-03	1.5170E-22	4652.0	8.5099E-03	3.4870E-22
4256.0	1.3943E-03	5.6600E-23	4456.0	3.5646E-03	1.4470E-22	4656.0	8.4323E-03	3.4230E-22
4260.0	1.4608E-03	5.9300E-23	4460.0	3.4882E-03	1.4160E-22	4660.0	8.3411E-03	3.3860E-22
4264.0	1.4312E-03	5.8100E-23	4464.0	3.4882E-03	1.4160E-22	4664.0	8.2968E-03	3.3680E-22
4268.0	1.3647E-03	5.5400E-23	4468.0	3.4365E-03	1.3950E-22	4668.0	8.4323E-03	3.4230E-22
4272.0	1.2958E-03	5.2600E-23	4472.0	3.4586E-03	1.4040E-22	4672.0	8.5531E-03	3.4720E-22
4276.0	1.2736E-03	5.1700E-23	4476.0	3.5104E-03	1.4250E-22	4676.0	8.7722E-03	3.5610E-22

Table VII. 03 GRAHAM AND JOHNSTON DATA AT 25C

WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)	WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)
4680.0	8.9299E-03	3.6250E-22	4880.0	1.8596E-02	7.5490E-22	5080.0	3.9883E-02	1.6190E-21
4684.0	9.1319E-03	3.7070E-22	4884.0	1.8636E-02	7.5650E-22	5084.0	3.9636E-02	1.6090E-21
4688.0	9.5408E-03	3.8730E-22	4888.0	1.8835E-02	7.6660E-22	5088.0	3.9242E-02	1.5930E-21
4692.0	9.7354E-03	3.9520E-22	4892.0	1.9094E-02	7.7510E-22	5092.0	3.9045E-02	1.5850E-21
4696.0	1.0021E-02	4.0680E-22	4896.0	1.9500E-02	7.9160E-22	5096.0	3.8774E-02	1.5740E-21
4700.0	1.0189E-02	4.1360E-22	4900.0	1.9764E-02	8.0230E-22	5100.0	3.8528E-02	1.5640E-21
4704.0	1.0270E-02	4.1690E-22	4904.0	2.0037E-02	8.1340E-22	5104.0	3.8331E-02	1.5560E-21
4708.0	1.0309E-02	4.1850E-22	4908.0	2.0429E-02	8.2930E-22	5108.0	3.8183E-02	1.5500E-21
4712.0	1.0354E-02	4.2030E-22	4912.0	2.0646E-02	8.3810E-22	5112.0	3.8109E-02	1.5470E-21
4716.0	1.0428E-02	4.2330E-22	4916.0	2.0902E-02	8.4850E-22	5116.0	3.8208E-02	1.5510E-21
4720.0	1.0420E-02	4.2300E-22	4920.0	2.1055E-02	8.5470E-22	5120.0	3.8355E-02	1.5570E-21
4724.0	1.0391E-02	4.2180E-22	4924.0	2.1173E-02	8.5950E-22	5124.0	3.8479E-02	1.5620E-21
4728.0	1.0383E-02	4.2150E-22	4928.0	2.1326E-02	8.6570E-22	5128.0	3.8749E-02	1.5730E-21
4732.0	1.0383E-02	4.2150E-22	4932.0	2.1422E-02	8.6960E-22	5132.0	3.9045E-02	1.5850E-21
4736.0	1.0534E-02	4.2760E-22	4936.0	2.1528E-02	8.7390E-22	5136.0	3.9464E-02	1.6020E-21
4740.0	1.0676E-02	4.3340E-22	4940.0	2.1582E-02	8.7610E-22	5140.0	3.9686E-02	1.6110E-21
4744.0	1.0829E-02	4.3960E-22	4944.0	2.1626E-02	8.7790E-22	5144.0	3.9907E-02	1.6200E-21
4748.0	1.1061E-02	4.4900E-22	4948.0	2.1725E-02	8.8190E-22	5148.0	4.0326E-02	1.6370E-21
4752.0	1.1280E-02	4.5790E-22	4952.0	2.1823E-02	8.8590E-22	5152.0	4.0546E-02	1.6460E-21
4756.0	1.1657E-02	4.7320E-22	4956.0	2.2080E-02	8.9630E-22	5156.0	4.1065E-02	1.6670E-21
4760.0	1.2026E-02	4.8820E-22	4960.0	2.2604E-02	9.1760E-22	5160.0	4.1336E-02	1.6780E-21
4764.0	1.2411E-02	5.0380E-22	4964.0	2.2868E-02	9.2830E-22	5164.0	4.1607E-02	1.6890E-21
4768.0	1.3096E-02	5.3160E-22	4968.0	2.3094E-02	9.3750E-22	5168.0	4.2001E-02	1.7050E-21
4772.0	1.3615E-02	5.5270E-22	4972.0	2.3526E-02	9.5500E-22	5172.0	4.2272E-02	1.7160E-21
4776.0	1.4354E-02	5.8270E-22	4976.0	2.4265E-02	9.8500E-22	5176.0	4.2642E-02	1.7310E-21
4780.0	1.4681E-02	6.0410E-22	4980.0	2.4634E-02	1.0000E-21	5180.0	4.2913E-02	1.7420E-21
4784.0	1.5492E-02	6.2890E-22	4984.0	2.5521E-02	1.0360E-21	5184.0	4.3159E-02	1.7520E-21
4788.0	1.6283E-02	6.6100E-22	4988.0	2.6556E-02	1.0780E-21	5188.0	4.3553E-02	1.7680E-21
4792.0	1.6642E-02	6.8370E-22	4992.0	2.7224E-02	1.1050E-21	5192.0	4.3775E-02	1.7770E-21
4796.0	1.7722E-02	7.1940E-22	4996.0	2.8255E-02	1.1470E-21	5196.0	4.4144E-02	1.7920E-21
4800.0	1.8288E-02	7.4240E-22	5000.0	2.8970E-02	1.1760E-21	5200.0	4.4489E-02	1.8060E-21
4804.0	1.8801E-02	7.6320E-22	5004.0	2.9709E-02	1.2060E-21	5204.0	4.4559E-02	1.8210E-21
4808.0	1.9486E-02	7.9100E-22	5008.0	3.0891E-02	1.2540E-21	5208.0	4.5401E-02	1.8430E-21
4812.0	1.9892E-02	8.0750E-22	5012.0	3.1729E-02	1.2860E-21	5212.0	4.5795E-02	1.8590E-21
4816.0	2.0436E-02	8.2960E-22	5016.0	3.2965E-02	1.3390E-21	5216.0	4.6559E-02	1.8900E-21
4820.0	2.0715E-02	8.4090E-22	5020.0	3.3798E-02	1.3720E-21	5220.0	4.7076E-02	1.9110E-21
4824.0	2.0909E-02	8.4880E-22	5024.0	3.4566E-02	1.4040E-21	5224.0	4.7569E-02	1.9310E-21
4828.0	2.1023E-02	8.5340E-22	5028.0	3.5769E-02	1.4520E-21	5228.0	4.8431E-02	1.9660E-21
4832.0	2.1023E-02	8.5340E-22	5032.0	3.6434E-02	1.4790E-21	5232.0	4.9096E-02	1.9930E-21
4836.0	2.0887E-02	8.4790E-22	5036.0	3.7395E-02	1.5180E-21	5236.0	5.0130E-02	2.0350E-21
4840.0	2.0707E-02	8.4060E-22	5040.0	3.7986E-02	1.5420E-21	5240.0	5.0894E-02	2.0660E-21
4844.0	2.0481E-02	8.3140E-22	5044.0	3.8528E-02	1.5640E-21	5244.0	5.1682E-02	2.0980E-21
4848.0	2.0119E-02	8.1670E-22	5048.0	3.9267E-02	1.5940E-21	5248.0	5.2766E-02	2.1420E-21
4852.0	1.9855E-02	8.0600E-22	5052.0	3.9686E-02	1.6110E-21	5252.0	5.3481E-02	2.1710E-21
4856.0	1.9449E-02	7.8950E-22	5056.0	4.0129E-02	1.6290E-21	5256.0	5.4614E-02	2.2170E-21
4860.0	1.9252E-02	7.8150E-22	5060.0	4.0277E-02	1.6350E-21	5260.0	5.5427E-02	2.2500E-21
4864.0	1.9035E-02	7.7270E-22	5064.0	4.0400E-02	1.6400E-21	5264.0	5.6289E-02	2.2850E-21
4868.0	1.8801E-02	7.6320E-22	5068.0	4.0400E-02	1.6400E-21	5268.0	5.7595E-02	2.3380E-21
4872.0	1.8687E-02	7.5860E-22	5072.0	4.0326E-02	1.6370E-21	5272.0	5.8506E-02	2.3750E-21
4876.0	1.8596E-02	7.5490E-22	5076.0	4.0080E-02	1.6270E-21	5276.0	5.9762E-02	2.4260E-21

Table VII. O3 GRAHAM AND JOHNSTON DATA AT 25C

WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)
5280.0	6.0551E-02	2.4560E-21
5284.0	6.1388E-02	2.4920E-21
5288.0	6.2571E-02	2.5400E-21
5292.0	6.3359E-02	2.5720E-21
5296.0	6.4468E-02	2.6170E-21
5300.0	6.5157E-02	2.6450E-21
5304.0	6.5798E-02	2.6710E-21
5308.0	6.6611E-02	2.7040E-21
5312.0	6.7202E-02	2.7280E-21
5316.0	6.7966E-02	2.7590E-21
5320.0	6.8409E-02	2.7770E-21
5324.0	6.8603E-02	2.7930E-21
5328.0	6.9370E-02	2.8160E-21
5332.0	6.9715E-02	2.8300E-21
5336.0	7.0059E-02	2.8440E-21
5340.0	7.0257E-02	2.8520E-21
5344.0	7.0330E-02	2.8550E-21
5348.0	7.0380E-02	2.8570E-21
5352.0	7.0380E-02	2.8570E-21
5356.0	7.0330E-02	2.8550E-21
5360.0	7.0281E-02	2.8530E-21
5364.0	7.0232E-02	2.8510E-21
5368.0	7.0183E-02	2.8490E-21
5372.0	7.0158E-02	2.8480E-21
5376.0	7.0133E-02	2.8470E-21
5380.0	7.0158E-02	2.8480E-21
5384.0	7.0232E-02	2.8510E-21
5388.0	7.0429E-02	2.8590E-21
5392.0	7.0651E-02	2.8680E-21
5396.0	7.1069E-02	2.8850E-21
5400.0	7.1365E-02	2.8970E-21
5404.0	7.1390E-02	2.8980E-21
5408.0	7.1808E-02	2.9150E-21
5412.0	7.2153E-02	2.9290E-21
5416.0	7.2769E-02	2.9540E-21
5420.0	7.3237E-02	2.9730E-21
5424.0	7.3681E-02	2.9910E-21
5428.0	7.4395E-02	3.0200E-21
5432.0	7.5109E-02	3.0490E-21
5436.0	7.5602E-02	3.0690E-21
5440.0	7.6021E-02	3.0860E-21
5444.0	7.6489E-02	3.1050E-21
5448.0	7.7129E-02	3.1310E-21
5452.0	7.7474E-02	3.1450E-21
5456.0	7.7992E-02	3.1660E-21
5460.0	7.8312E-02	3.1790E-21
5464.0	7.8632E-02	3.1920E-21
5468.0	7.9051E-02	3.2090E-21
5472.0	7.9371E-02	3.2220E-21
5476.0	7.9639E-02	3.2410E-21

WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)
5480.0	8.0135E-02	3.2530E-21
5484.0	8.0341E-02	3.2630E-21
5488.0	8.0825E-02	3.2820E-21
5492.0	8.1046E-02	3.2910E-21
5496.0	8.1416E-02	3.3050E-21
5500.0	8.1637E-02	3.3140E-21
5504.0	8.1884E-02	3.3240E-21
5508.0	8.2303E-02	3.3410E-21
5512.0	8.2598E-02	3.3530E-21
5516.0	8.3042E-02	3.3710E-21
5520.0	8.3362E-02	3.3840E-21
5524.0	8.3633E-02	3.3950E-21
5528.0	8.4076E-02	3.4130E-21
5532.0	8.4372E-02	3.4250E-21
5536.0	8.4689E-02	3.4460E-21
5540.0	8.5308E-02	3.4630E-21
5544.0	8.5727E-02	3.4800E-21
5548.0	8.6343E-02	3.5050E-21
5552.0	8.6737E-02	3.5210E-21
5556.0	8.7402E-02	3.5480E-21
5560.0	8.7870E-02	3.5670E-21
5564.0	8.8363E-02	3.5870E-21
5568.0	8.9126E-02	3.6180E-21
5572.0	8.9693E-02	3.6410E-21
5576.0	9.0604E-02	3.6780E-21
5580.0	9.1269E-02	3.7050E-21
5584.0	9.2008E-02	3.7350E-21
5588.0	9.3142E-02	3.7810E-21
5592.0	9.3931E-02	3.8130E-21
5596.0	9.5112E-02	3.8610E-21
5600.0	9.5901E-02	3.8930E-21
5604.0	9.6689E-02	3.9250E-21
5608.0	9.7871E-02	3.9730E-21
5612.0	9.8684E-02	4.0060E-21
5616.0	9.9842E-02	4.0530E-21
5620.0	1.0058E-01	4.0830E-21
5624.0	1.0134E-01	4.1140E-21
5628.0	1.0240E-01	4.1570E-21
5632.0	1.0309E-01	4.1850E-21
5636.0	1.0410E-01	4.2260E-21
5640.0	1.0477E-01	4.2530E-21
5644.0	1.0538E-01	4.2780E-21
5648.0	1.0620E-01	4.3110E-21
5652.0	1.0676E-01	4.3340E-21
5656.0	1.0750E-01	4.3640E-21
5660.0	1.0802E-01	4.3850E-21
5664.0	1.0856E-01	4.4070E-21
5668.0	1.0928E-01	4.4360E-21
5672.0	1.0972E-01	4.4540E-21
5676.0	1.1036E-01	4.4800E-21

WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)
5680.0	1.1086E-01	4.4980E-21
5684.0	1.1127E-01	4.5170E-21
5688.0	1.1189E-01	4.5420E-21
5692.0	1.1243E-01	4.5640E-21
5696.0	1.1302E-01	4.5880E-21
5700.0	1.1344E-01	4.6050E-21
5704.0	1.1393E-01	4.6250E-21
5708.0	1.1460E-01	4.6520E-21
5712.0	1.1499E-01	4.6680E-21
5716.0	1.1558E-01	4.6920E-21
5720.0	1.1598E-01	4.7080E-21
5724.0	1.1640E-01	4.7250E-21
5728.0	1.1684E-01	4.7430E-21
5732.0	1.1714E-01	4.7550E-21
5736.0	1.1746E-01	4.7680E-21
5740.0	1.1760E-01	4.7740E-21
5744.0	1.1765E-01	4.7760E-21
5748.0	1.1755E-01	4.7720E-21
5752.0	1.1746E-01	4.7680E-21
5756.0	1.1723E-01	4.7590E-21
5760.0	1.1711E-01	4.7540E-21
5764.0	1.1699E-01	4.7490E-21
5768.0	1.1659E-01	4.7330E-21
5772.0	1.1627E-01	4.7200E-21
5776.0	1.1585E-01	4.7030E-21
5780.0	1.1553E-01	4.6900E-21
5784.0	1.1516E-01	4.6750E-21
5788.0	1.1462E-01	4.6530E-21
5792.0	1.1428E-01	4.6390E-21
5796.0	1.1372E-01	4.6160E-21
5800.0	1.1334E-01	4.6010E-21
5804.0	1.1295E-01	4.5850E-21
5808.0	1.1238E-01	4.5620E-21
5812.0	1.1204E-01	4.5480E-21
5816.0	1.1157E-01	4.5290E-21
5820.0	1.1120E-01	4.5140E-21
5824.0	1.1086E-01	4.5010E-21
5828.0	1.1046E-01	4.4840E-21
5832.0	1.1014E-01	4.4710E-21
5836.0	1.0977E-01	4.4560E-21
5840.0	1.0952E-01	4.4460E-21
5844.0	1.0933E-01	4.4360E-21
5848.0	1.0901E-01	4.4250E-21
5852.0	1.0876E-01	4.4150E-21
5856.0	1.0854E-01	4.4060E-21
5860.0	1.0841E-01	4.4010E-21
5864.0	1.0834E-01	4.3980E-21
5868.0	1.0822E-01	4.3930E-21
5872.0	1.0817E-01	4.3910E-21
5876.0	1.0812E-01	4.3890E-21

Table VII.03 GRAHAM AND JOHNSTON DATA AT 25C

WVLGTH (A)	ABSORPTION COEFFICIENT (CM-1 ATM-1)	CROSS SECTION (CM**2)
5880.0	1.0814E-01	4.3900E-21
5884.0	1.0819E-01	4.3920E-21
5888.0	1.0832E-01	4.3970E-21
5892.0	1.0841E-01	4.4010E-21
5896.0	1.0854E-01	4.4060E-21
5900.0	1.0869E-01	4.4120E-21
5904.0	1.0878E-01	4.4160E-21
5908.0	1.0910E-01	4.4290E-21
5912.0	1.0942E-01	4.4420E-21
5916.0	1.0994E-01	4.4630E-21
5920.0	1.1036E-01	4.4800E-21
5924.0	1.1085E-01	4.5000E-21
5928.0	1.1167E-01	4.5330E-21
5932.0	1.1221E-01	4.5550E-21
5936.0	1.1314E-01	4.5930E-21
5940.0	1.1381E-01	4.6200E-21
5944.0	1.1445E-01	4.6460E-21
5948.0	1.1539E-01	4.6840E-21
5952.0	1.1613E-01	4.7140E-21
5956.0	1.1714E-01	4.7550E-21
5960.0	1.1785E-01	4.7840E-21
5964.0	1.1864E-01	4.8160E-21
5968.0	1.1977E-01	4.8620E-21
5972.0	1.2046E-01	4.8900E-21
5976.0	1.2154E-01	4.9340E-21
5980.0	1.2223E-01	4.9620E-21
5984.0	1.2290E-01	4.9890E-21
5988.0	1.2381E-01	5.0260E-21
5992.0	1.2440E-01	5.0500E-21
5996.0	1.2519E-01	5.0820E-21
6000.0	1.2571E-01	5.1030E-21

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Appendix I

VERTICAL DISTRIBUTION OF NO_2 IN THE STRATOSPHERE AS DETERMINED FROM BALLOON MEASUREMENTS OF SOLAR SPECTRA IN THE 4500Å REGION

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Abstract. The stratospheric NO_2 mixing ratio profile in the 20-40 km altitude range is derived from balloon-borne observations of the solar spectrum in the visible region. By comparisons of high sun and low sun spectra at float altitude (∿40 km), a number of NO_2 features are identified. The resulting NO_2 profile shows a gradual increase above 20 km to a peak value of 13 ppb(v) near 35 km, followed by a gradual decrease to 10.5 ppb(v) at 40 km.

Introduction

Atmospheric NO_2 amounts derived from solar spectra in the visible region were reported earlier by Brewer et al. [1973], Noxon [1975], and Kerr and McElroy [1976]. A more detailed study of the atmospheric NO_2 features in the solar spectrum in the visible region is reported here, showing a new determination of the NO_2 profile based on solar spectra obtained during a balloon flight of 9 Feb. 1977 by our group from Holloman AFB, New Mexico. The flight covered the visible region (3500Å-6000Å) at ∿0.6Å resolution and reached a float altitude of ∿40 km. Numerous scans were obtained during ascent and from float altitude during sunset.

Comparisons of low sun scans with high sun scans show significant atmospheric continuum extinction and should also allow for the identification of atmospheric lines superimposed on the attenuated solar spectrum. This is complicated by the fact that the solar spectrum itself is very rich in line structure in the visible region. Examples of the spectra obtained at high and low sun are shown in Figs. 1 and 2 for the 4400-4500Å region. Pertinent details for the scans are given in Table 1. It is seen in the figures that the amplitude has been attenuated significantly during the sunset period. Examination of the fine structure behavior during sunset shows only minute changes in relative intensity patterns of the solar lines; thus, the identification of any weak atmospheric line structure superimposed on these spectra is not straightforward.

It might be expected that a direct ratio of a low sun to a high sun scan should show the atmospheric features. However, such a ratio is very

sensitive to small wavelength shifts between the two scans. Therefore, it was useful to digitally degrade the resolution to ~5Å prior to ratioing. As a result, a large number of NO_2 and O_3 features were identified on the sunset spectra. The NO_2 features were then used to derive the NO_2 mixing ratio profile in the 20 to 40 km altitude range.

Analysis and Results

A comparison of degraded resolution spectra of scans 89 (low sun) and 61 (high sun) as well as their ratio, already corrected for Rayleigh scattering, are shown in Fig. 3. The Rayleigh scattering transmittance ratio between the high sun path to the low sun path is separately plotted on the same figure and is labelled Rayleigh. At low sun the change of air mass during the scan was taken into account in this ratio. Also shown in this figure are synthetic absorption spectra of NO_2 and O_3, based on the unpublished absorption coefficients of Johnston and Graham at ~5Å resolution [1977]. These coefficients are in good agreement with previously published values (the sources agree within ±10%; see below for references) and were the only ones conveniently available for the region of interest in a digital form. The gas amounts used here are 0.01 atm cm NO_2 and 20 atm cm O_3, both chosen to exaggerate the expected atmospheric absorptions. Actual gas amounts along the sunset path for scan 89 as derived by ray-tracing computations [Goldman et al., 1977] with a standard O_3 distribution and the NO_2 distribution derived in the present paper are 0.0086 atm cm NO_2 and 10.8 atm cm O_3.

The weak fine structure of the degraded resolution ratio spectra between 4000 and 4700Å shows a number of identifiable NO_2 features. Three of the prominent ones have been marked in Fig. 3 and have been used here for the profile derivation. Two of the marked features have been previously assigned to atmospheric NO_2 by Noxon [1975] who presented ground-based low resolution atmospheric NO_2 spectra from which NO_2 amounts were derived. Brewer et al. [1973] and Kerr and McElroy [1976] also deduced NO_2 amounts from atmospheric extinctions at wavelengths near 4450Å, but do not present actual spectra. It is seen from the synthetic NO_2 spectrum that the NO_2 peaks are superimposed on a relatively strong NO_2 continuum. Therefore, a single wavelength quantification of NO_2 from such spectra

requires good continuum extinction estimates (both atmospheric and instrumental), which are not completely known for the sunset spectra. In order to eliminate these continuum difficulties, the three wavelength differential method of Brewer et al. [1973] has been used here. This method also eliminates the possible aerosols contribution.

Features due to O_3 can also be recognized on the ratio spectrum in Fig. 3 between 4400 and 5000Å. These are due to the wings of the Chappuis bands and are much broader than the NO_2 features. The features identified as NO_2 and O_3 reproduce consistently on the ratio spectra of many different pairs of high and low sun spectra. In addition, several other features are consistently observed on the ratio spectra between 4000 and 5000Å. These could be due to yet unidentified atmospheric absorptions. The structure on the ratio spectrum between 3500 and 4000Å does not represent atmospheric absorption features, but is mostly due to low signal at the end of the low sun scan.

For the NO_2 profile derivation seven wavelengths were chosen in the region of the three NO_2 features makred in Fig. 3. These are 4379, 4393, 4418, 4448, 4466, 4479 and 4494Å, representing alternate minimum and maximum absorptions and are shown in more detail in Fig. 6 which is discussed in detail later. Their corresponding absorption coefficients are 10.5, 17.5, 9.3, 17.3, 10.5, 18.5 and 11.0 $atm^{-1}cm^{-1}$ [Johnston and Graham, 1977]. The temperature dependence of the NO_2 absorption coefficients has been shown to be quite small for the wavelength region 1850 to 4100Å [Bass et al., 1976] and is neglected in the present work.

The three wavelength differential method [Brewer et al., 1973] was applied to each of the peak absorption wavelengths marked in Fig. 3 and two adjacent minimum absorption wavelengths. High sun observations (zenith angles $\leq 80^{\circ}$) were used to establish reference ratios of signals in the absence of significant NO_2 absorption. Low sun observations (zenith angles $\geq 90^{\circ}$) were then used to determine the total amounts of NO_2 along successively deeper atmosheric paths. The process was repeated for several pairs of high and low sun scans, by using scans 60, 61, 64 and 66 for high sun and scans 85 through 90 for low sun. The NO_2 amounts determined from several pairs of high and low sun spectra at the peak absorption wavelengths are shown in Fig. 4. A best estimate of the NO_2 amount versus air mass is shown by the plotted curve through the mean position of the plotted points.

From the results shown in Fig. 4, the NO_2 mixing ratio profile was derived using a scheme developed by Goldman et al. [1977]. This scheme is based on exact air mass distributions along the optical paths at solar zenith angles greater than 90°. The NO_2 values have been taken from Fig. 4 at the apparent zenith angles of 91.5, 92.0, 92.5, 93.0, 93.5, 94.0 and 94.5°. The resulting NO_2 mixing ratios are plotted in Fig. 5 where the histogram indicates the constant mixing ratio layers used. The mixing ratio profile (solid line) covers the 20 to 40 km range and the broken line above 40 km indicates a one-layer calculation at 91.5°. The profile shows a gradual increase in the NO_2 mixing ratio from 1.4 ppb(v) at 20 km to its peak value of 12.9 ppb(v) at 35 km, followed by a gradual decrease to 10.5 ppb(v) at 40 km. This profile is in good agreement with the profiles derived by Kerr and McElroy [1976] which extend up to 35 km and show peak mixing ratio values of about 10 ppb(v) near 31 km. Particularly good agreement is noticed with the NO_2 profile derived earlier from infrared solar spectra [Murcray et al., 1974].

Discussion

The results presented above were based on the application of a 100-point triangular filter to the data, corresponding to $\sim$5Å resolution. This is appropriate for the relatively broad NO_2 absorption features seen in Figs. 3 and 6 [Hall and Blacet, 1952; Wilkerson et al., 1974; Johnston and Graham, 1977]. Higher resolution data [Wilkerson et al., 1974 at 0.03Å resolution; Bass et al., 1976 at 0.2Å resolution] show additional weak fine structure superimposed on the broad features, but the general shape, magnitude and width of the low resolution features is only slightly changed.

In order to examine the effects of the digital filtering on the derived NO_2 amounts, the computations were performed with triangular filters of 200, 100 and 50 points corresponding to resolutions of about 10, 5 and 2.5Å. Figure 6 shows scans 89 and 61, as well as their ratios with the 3 filters. While the major NO_2 features are similar in the ratio plots at the 3 resolutions, the derived NO_2 amounts show almost a factor of two variation. The trend is to greater NO_2 amounts with higher resolution, because increased smoothing tends to reduce the amplitude differences between absorption peaks and minima.

In addition, averaging the data with a digital filter can introduce errors from cross correlations between the solar spectra and the NO_2 absorption spectra. However, the NO_2 absorption features are broader than both the solar lines and the 100-point filter so that the cross correlations, while not zero, will be small. The factor of two spread appears to be mostly due to minor instabilities in the signal amplitudes which are enhanced by the differential method. The $\sim$5Å filter was found optimum for the present analysis.

Figure 3 shows that ozone also contributes to the absorption in the spectral region of the NO_2. Using the ozone absorption coefficients of Johnston and Graham [1977] for low sun scan 89, the error introduced to the NO_2 values derived here by ignoring ozone would be on the order of 5%. This error is small due to the nature of the three wavelength method, in which O_3 serves as a semi-continuum for NO_2. This result is in agreement with the discussion by Johnston [1974].

From the above discussion, our estimate is that the absolute error in the NO_2 mixing ratio profile is about $\pm$75% while the relative error is about $\pm$25%. These errors are significantly larger than those obtained for NO_2 profiles derived from infrared spectra where NO_2 signatures on the solar spectrum are significantly larger than those in the visible. The absolute and relative errors in the infrared measurements are estimated as $\pm$25% and $\pm$10% respectively. A more detailed account of the analysis presented here is available [Goldman, 1978].

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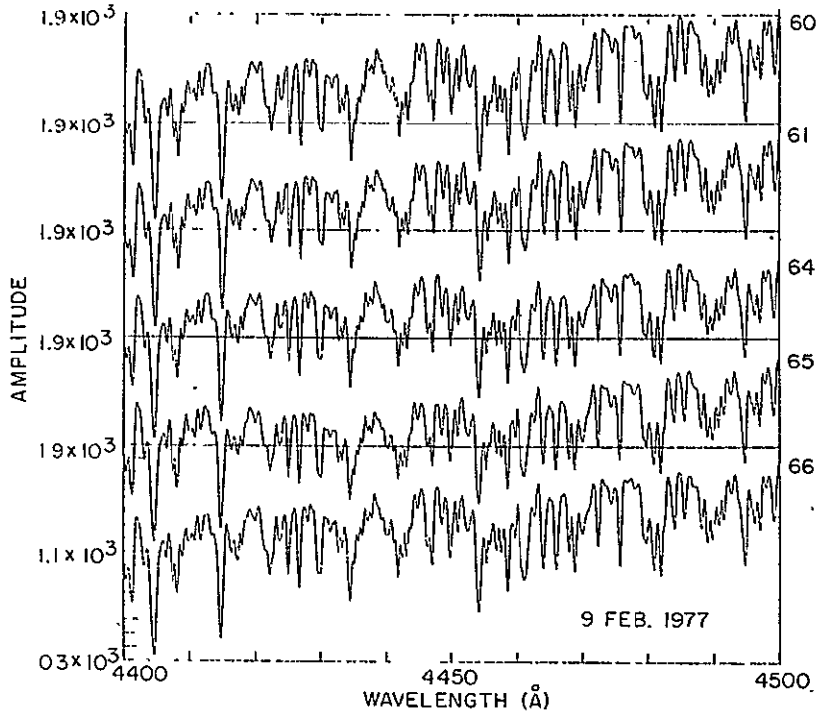

Fig. 1. Observed amplitude vs wavelength for high sun at 0.6Å resolution in the 4400-4500Å region. Scan details are given in Table 1. The scans are each plotted on a 300-1900 scale and shifted vertically for clarity.

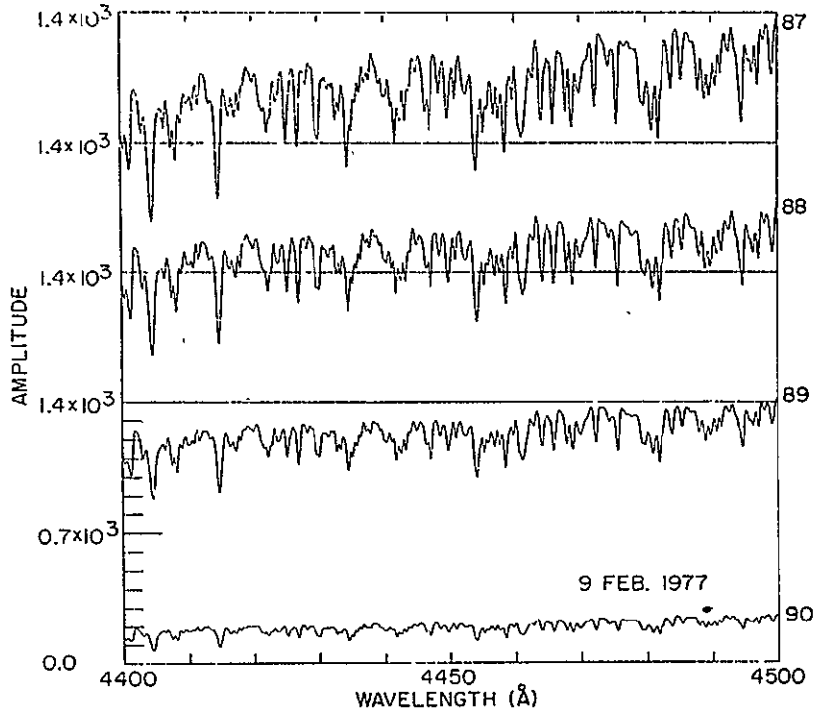

Fig. 2. Observed amplitude vs wavelength for low sun at 0.6Å resolution in the 4400-4500Å region. Scan details are given in Table 1. The scans are each plotted on a 0-1400 scale and shifted vertically for clarity.

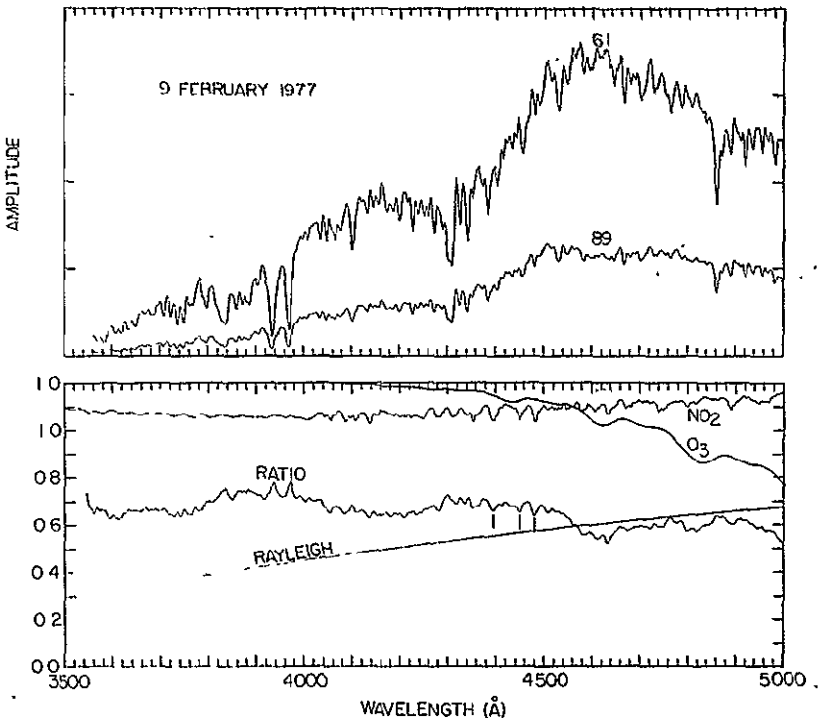

Fig. 3. Top frame: scans 89 and 61, degraded to ~5Å resolution. Bottom frame: ratio of the degraded scans 89 to 61, corrected for the Rayleigh scattering curve, and synthetic spectra of NO_2 (0.01 atm cm) and O_3 (20 atm cm). The vertical axis for NO_2 and O_3 is transmittance (0 to 1 scale) and is shifted upwards two divisions from the 0 to 1 scale for the Rayleigh corrected ratio.

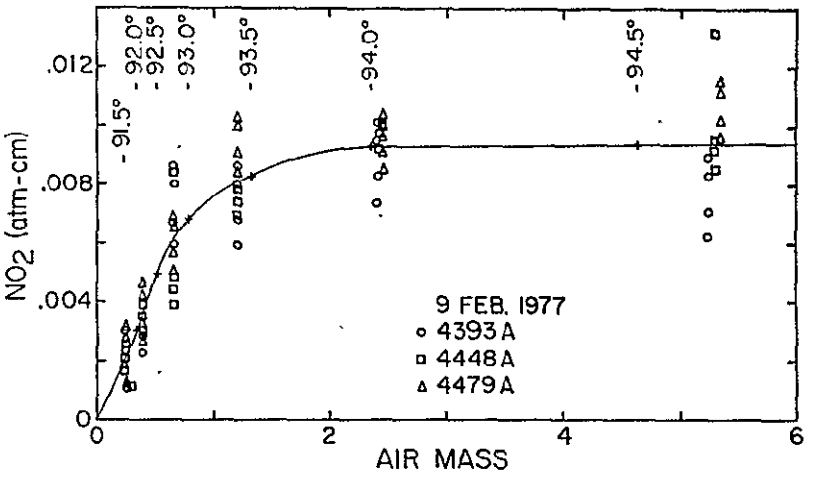

Fig. 4. NO_2 amounts vs air mass and apparent zenith angle as derived from several sunset paths during the 9 Feb. 1977 flight. For each of the NO_2 absorption peaks at 4393, 4448 and 4479Å several pairs of high and low sun scans were used. The air mass is calculated at the time corresponding to the NO_2 absorption within each scan.

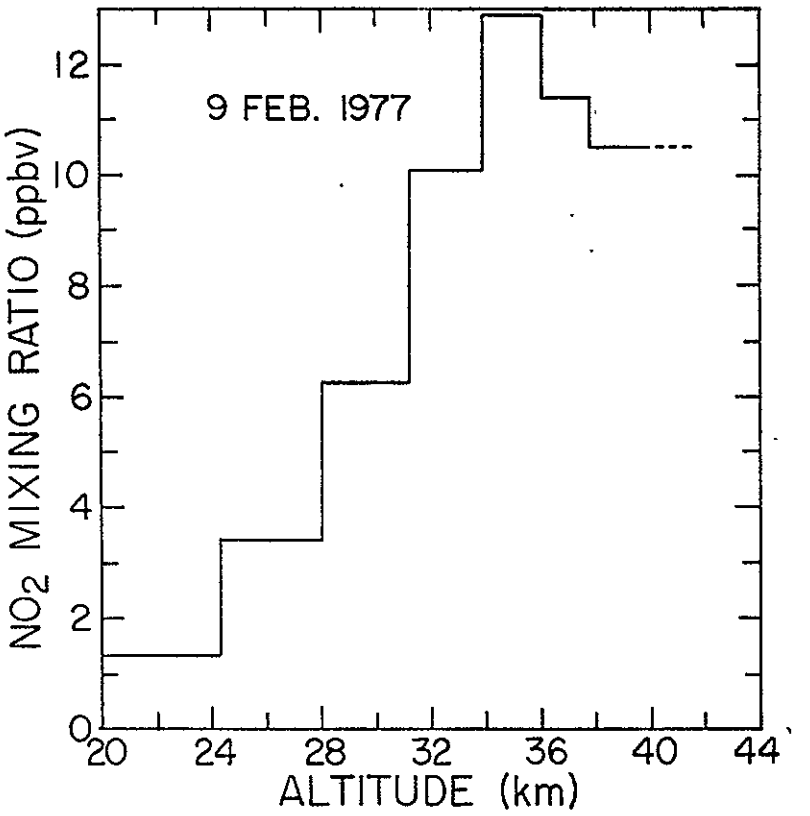

Fig. 5. Mixing ratio of NO_2 as derived from the 9 Feb. 1977 balloon flight from Holloman AFB, NM.

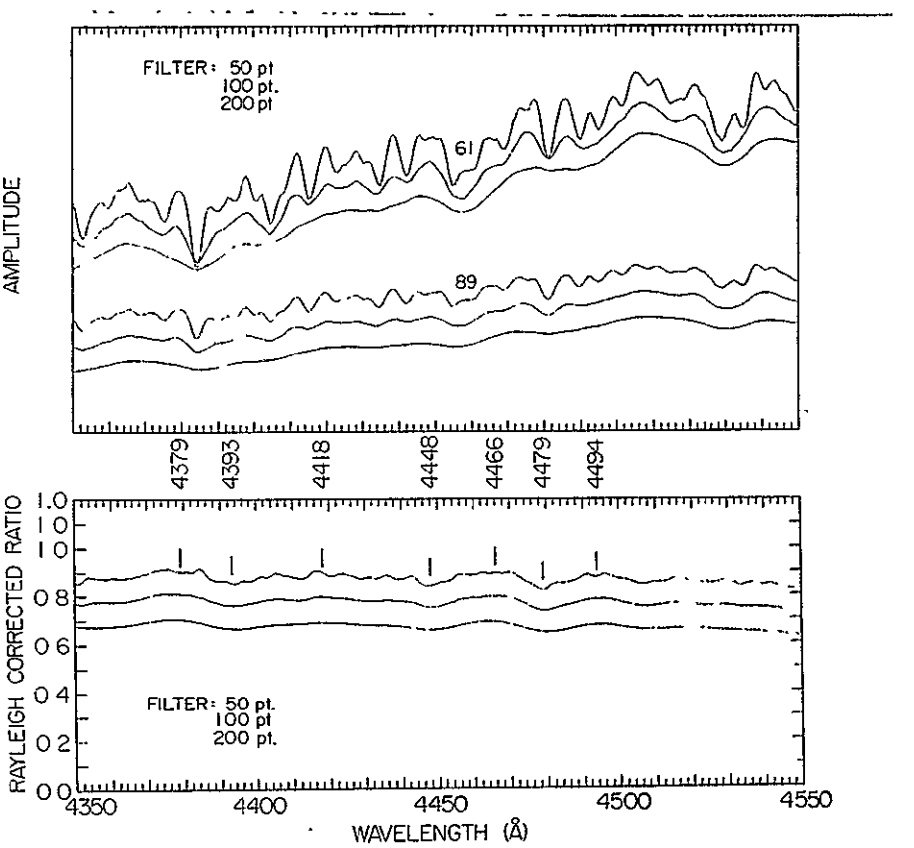

Fig. 6. The effect of different triangular filters on high sun (61) and low sun (89) scans and their ratio. The filters of 50, 100 and 200 points, correspond to 2.5, 5 and 10Å resolution.

TABLE1. Details for scans of 9 February 1977 flight. Values are at the start of scan.

Scan No.	Time (MST)	Altitude (km)	Pressure (mb)	Temperature (^{o}K)	Solar Zenith Angle (^{o})	Air Mass
60	1624:54	36.51	4.66	228	76.38	0.0195
61	1627:56	36.90	4.41	228	76.95	0.0193
64	1637:01	38.30	3.63	228	78.89	0.0186
65	1640:02	38.57	3.50	228	79.46	0.0189
66	1643:04	38.84	3.37	228	80.04	0.0192
87	1746:39	41.06	2.49	238	92.71	0.514
88	1749:41	40.88	2.55	238	93.33	0.940
89	1752:42	41.27	2.42	238	93.94	1.746
90	1755:44	41.12	2.47	238	94.56	3.809

Appendix II

ADDITIONAL DETAILS AND RESULTS

The three wavelength differential method (see Appendix I) is used in the following manner. At a given narrow spectral wavelength interval centered at wavelength, λ_i, with i = 1, 2, 3 let

I_i = the integrated solar flux at the detector,

I_{o_i} = the integrated solar flux outside the earth's atmosphere,

γ_i = the attenuation coefficient due to Rayleigh scattering,

and C = the unknown continuum absorption assumed independent of wavelength.

Then the exponential absorption law gives

$$\ell n\, I_i = \ell n\, I_{o_i} - \alpha_i X - \gamma_i M - C \qquad (1)$$

where X = the total amount of NO_2 along the path,

and M = the total airmass along the path.

By comparing measured fluxes at two different wavelengths, λ_1 (an NO_2 absorption minimum) and λ_2 (an absorption peak), the continuum effects can be removed by

$$\ell n \frac{I_1}{I_2} = \ell n \frac{I_{o_1}}{I_{o_2}} - (\alpha_1 - \alpha_2) X - (\gamma_1 - \gamma_2) M . \qquad (2)$$

Selection of a measured flux at a third wavelength, λ_3 (an absorption minimum), allows the Rayleigh attenuation to be removed. Equation (2)

can be rewritten for λ_2 and λ_3. When multiplied through by $B = (\gamma_1 - \gamma_2) / (\gamma_2 - \gamma_3)$ and subtracted from Eq. (2), this equation yields

$$\ln \frac{I_1}{I_2} - B \ln \frac{I_2}{I_3} = \ln \frac{I_{o_1}}{I_{o_2}} - B \ln \frac{I_{o_2}}{I_{o_3}} - AX \quad , \tag{3}$$

where A is the combination of Rayleigh scattering and NO_2 absorption coefficients, $A = (\alpha_1 - \alpha_2) - B(\alpha_2 - \alpha_3)$. If the terms representing the measured fluxes through the atmosphere and the fluxes outside the atmosphere are designated by F and F_o respectively, Eq. (3) becomes

$$F = F_o - AX \tag{4}$$

where $$F = \ln \frac{I_1}{I_2} - B \ln \frac{I_2}{I_3}$$

and $$F_o = \ln \frac{I_{o_1}}{I_{o_2}} - B \ln \frac{I_{o_2}}{I_{o_3}} \quad .$$

F_o can be approximated from high sun observations at float altitude, as the NO_2 amounts along the path are assumed to be negligible. With F determined from fluxes measured at low sun positions, the NO_2 calculation becomes

$$X = (F - F_o) / A \quad . \tag{5}$$

As shown in Appendix I, ozone also contributes to the absorption in the spectral region of the NO_2 computations. Equation (1), rewritten to include ozone absorption, becomes

$$\ln I_i = \ln I_{o_i} - \alpha_i X - \gamma_i M + \delta_i \Omega + C \quad , \tag{7}$$

where δ_i = the ozone absorption coefficient

and Ω = the total amount of ozone along the path.

With this addition Eq. (5) becomes

$$X = (F_o - F - D\Omega) / A, \tag{8}$$

where $D = \delta_1 - \delta_2 - B(\delta_2 - \delta_3)$.

Using the ozone absorption coefficients of Johnston and Graham at the wavelengths listed in Appendix I, and assuming that there are 11 atm-cm of ozone (see below) along the path for the low sun scan No. 89, the error introduced by ignoring ozone would be of the order of 5%

The scheme for obtaining mixing ratio profiles from sunset spectra emphasizes the importance of accurately describing the airmass distributions along the long optical paths at solar zenith angles greater than 90^o (see Appendix I). Although the airmass distribution tables were developed for infrared wavelengths, they apply equally as well to visible wavelengths, and were used to generate an NO_2 profile from the data displayed in Figs. 1 and 2 of Appendix I.

The float altitude and the altitudes of the tangent rays are used to define the boundaries of the stratospheric layers. The total NO_2 amounts and the total airmass along Ray 1 are used to approximate the uppermost NO_2 mixing ratio, β_1 , for the layer extending from height 2 to infinity according to the equation

$$\beta_1 = \frac{X_1}{(2M_{1,2} + M_r) \times U_o} \quad , \tag{9}$$

where X_1 = the amount of NO_2 in atm-cm,

$M_{1,2}$ = the airmass along the ray, between altitude 1 and 2, which is traversed twice,

M_r = the airmass remaining between altitude 1 and infinity and is traversed only once,

and U_o = one airmass (8×10^5 atm-cm STP).

Once the mixing ratio has been established for the upper layer, its value can in turn be used along with the total NO_2 observed along Ray 2 to establish mixing ratio β_2 in the layer bounded by altitudes 2 and 3 by

$$\beta_2 = \frac{X_2 - U_o (2M_{1,2} + M_r) \times \beta_1}{U_o \times 2M_{2,3}} \tag{10}$$

For a subsequent layer, n, the general form of Eq. (10) becomes

$$\beta_n = \frac{X_n - U_o \left[2 \sum_{k=1}^{n-1} M_{k,k+1} \beta_k + M_r \beta_1\right]}{U_o \times 2M_{n,n+1}} \tag{11}$$

In order that the tabulated values of Goldman et al. in Appendix I could be applied directly to the determination of the NO_2 mixing ratio profile without having to extrapolate between tabulated values, total NO_2 values have been taken at airmasses corresponding to tabulated zenith angles of 91.5, 92.0, 92.5, 93.0, 93.5, and 94.0. The zenith angle, altitude

of the tangent ray, total NO_2 amount, total airmass, and airmass within each layer traversed are presented in Table I along with the resulting mixing ratios. These results are also plotted in Figs. 4 and 5 of Appendix I.

The ray tracing program was also used to derive O_3 and NO_2 distributions and total gas amounts for several sunset paths from balloon altitudes of 30 and 40 km (corresponding to the two balloon flights of interest). A standard O_3 vertical distribution and the NO_2 vertical distribution as derived in the present work were used. The total airmass and gas amounts are shown in Table II, where a number of zenith angles were used at each balloon altitude. The gas amount distributions along selected paths are shown here in Figs. 1 to 4. It is apparent that there are significant differences in the O_3 and NO_2 amounts in the 30 km and 40 km cases for zenith angles of 90° to 93°.

Table I.
Inversion of Low Sun Data with Observer Altitude of 40.0 (km)
NO_2

Path Angle (deg)	Obsvr. Alt. (km)	Layer Boundaries (km) 1	2	3	4	5	6	7
91.5	40.00	37.80						
92.0	40.00	37.00	36.09					
92.5	40.00	37.00	36.00	33.89				
93.0	40.00	37.00	36.00	33.00	31.20			
93.5	40.00	37.00	36.00	33.00	31.00	28.01		
94.0	40.00	37.00	36.00	33.00	31.00	28.00	24.33	
94.5	40.00	37.00	36.00	33.00	31.00	28.00	24.00	20.12

Path Angle (deg)	Air Mass in Layers 1	2	3	4	5	6	7
91.5	2.486E-01						
92.0	6.421E-02	7.759E-02					
92.5	4.388E-02	2.502E-02	1.578E-01				
93.0	3.443E-02	1.748E-02	9.565E-02	2.208E-01			
93.5	2.860E-02	1.381E-02	6.617E-02	8.139E-02	4.481E-01		
94.0	2.456E-02	1.153E-02	5.248E-02	5.819E-02	1.617E-01	8.513E-01	
94.5	2.156E-02	9.953E-03	4.407E-02	4.674E-02	1.187E-01	3.551E-01	1.696E+00

Path Angle (deg)	Hmin (km)	Total Air Mass	Residual Air Mass	NO_2 Total Gas Amount (atm-cm)	NO_2 Vol. Mix. Ratio β	Inner Layer Boundaries upper (km)	lower (km)
91.5	37.80	2.486E-01	0.0	2.100E-03	1.056E-08	40.00	37.80
92.0	36.09	3.432E-01	5.962E-02	3.000E-03	1.137E-08	37.00	36.09
92.5	33.89	5.061E-01	5.258E-02	4.900E-03	1.291E-08	36.00	33.89
93.0	31.20	7.836E-01	4.688E-02	6.830E-03	1.007E-08	33.00	31.20
93.5	28.01	1.318E+00	4.219E-02	8.250E-03	6.251E-09	31.00	28.01
94.0	24.33	2.358E+00	3.830E-02	9.280E-03	3.446E-09	28.00	24.33
94.5	20.12	4.619E+00	3.501E-02	9.390E 03	1.379E-09	24.00	20.12

Table II.

Total gas amounts along low sun paths by ray-tracing (including refraction)

Apparent Zenith Angle (deg)	Air Mass	Minimum Altitude (km)	O_3 Total Column (molecules/cm^2) $\times 10^{-20}$	O_3 (cm-atm) STP	NO_2 Total Column (molecules/cm^2) $\times 10^{-17}$	NO_2 (cm-atm) STP
			Observer Altitude 30 (km)			
90.5	0.629	29.75	1.158	4.308	1.137	0.0042
91.0	0.825	29.02	1.503	5.590	1.362	0.0051
91.5	1.119	27.79	1.876	6.975	1.580	0.0059
92.0	1.581	26.08	2.288	8.508	1.775	0.0066
92.5	2.355	23.86	2.647	9.845	1.927	0.0072
93.0	3.756	21.15	3.266	12.147	1.999	0.0074
93.5	6.469	17.90	3.575	13.296	2.259	0.0084
94.0	12.088	14.09	3.420	12.717	2.519	0.0094
94.5	22.900	9.70	3.021	11.234	3.037	0.0113
			Observer Altitude 40 (km)			
90.5	0.144	39.76	0.189	0.702	0.234	0.0009
91.0	0.187	39.02	0.262	0.970	0.336	0.0012
91.5	0.249	37.80	0.374	1.392	0.497	0.0018
92.0	0.343	36.09	0.552	2.050	0.753	0.0028
92.5	0.506	33.89	0.871	3.239	1.221	0.0045
93.0	0.784	31.20	1.425	5.300	1.702	0.0063
93.5	1.318	28.02	2.302	8.561	2.106	0.0078
94.0	2.358	24.33	2.907	10.810	2.312	0.0086
94.5	4.619	20.12	3.723	13.844	2.410	0.0090
95.0	10.000	15.34	3.709	13.790	2.731	0.0102
95.5	22.420	9.91	3.258	12.115	3.271	0.0122

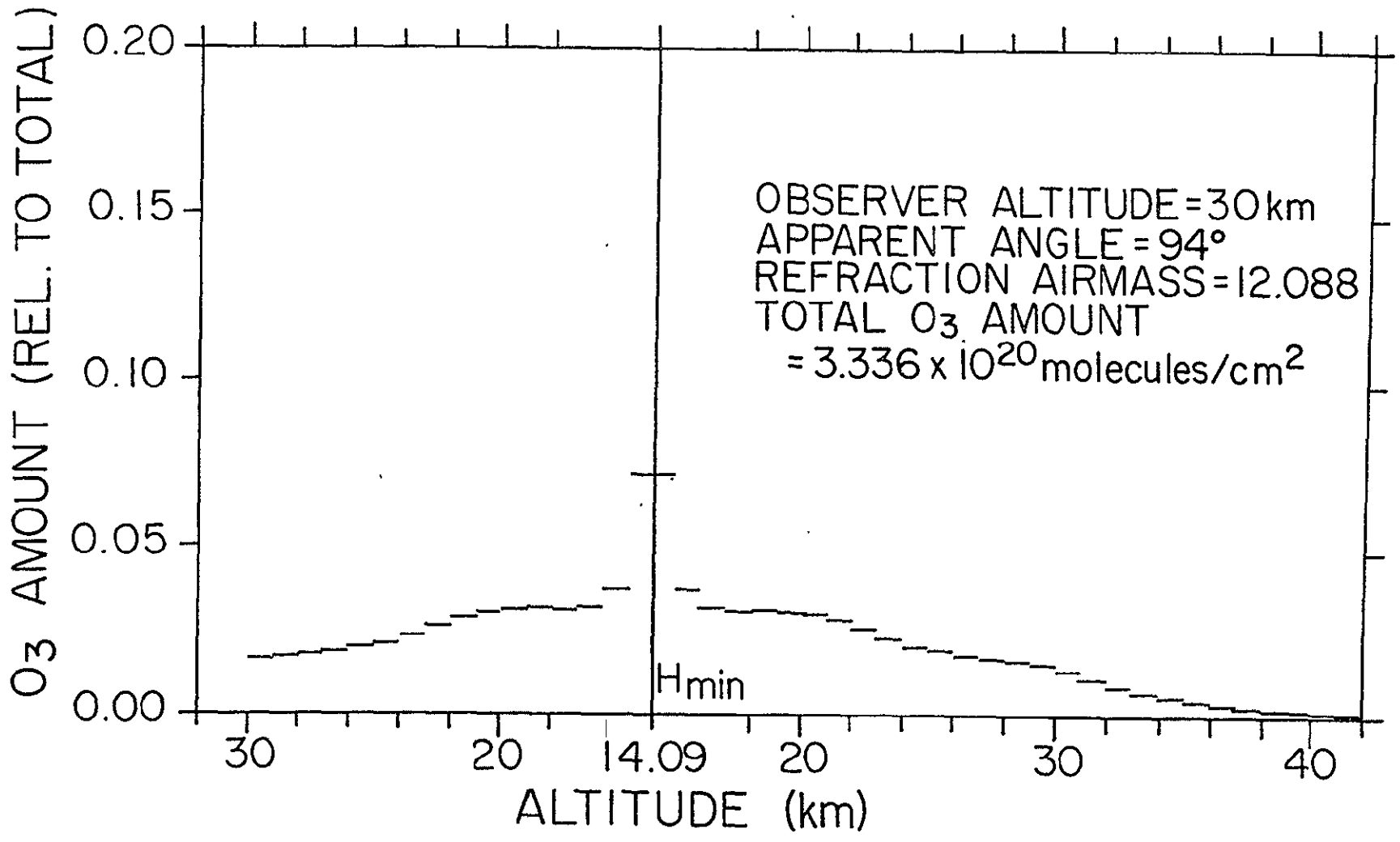

Figure 1. O_3 distribution for a 94^o path from 30 km altitude.

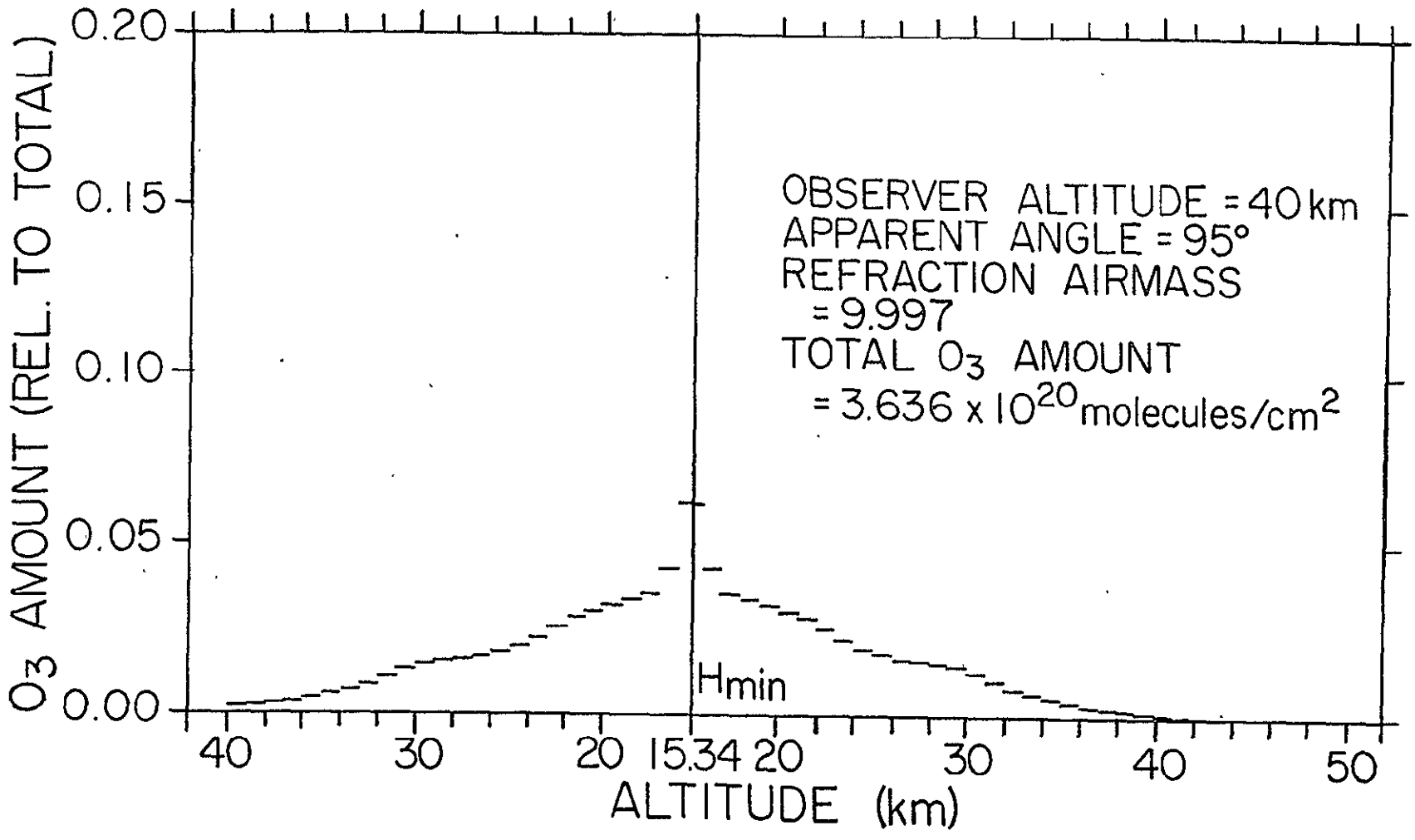

Figure 2. O_3 distribution for a 94° path from 40 km altitude.

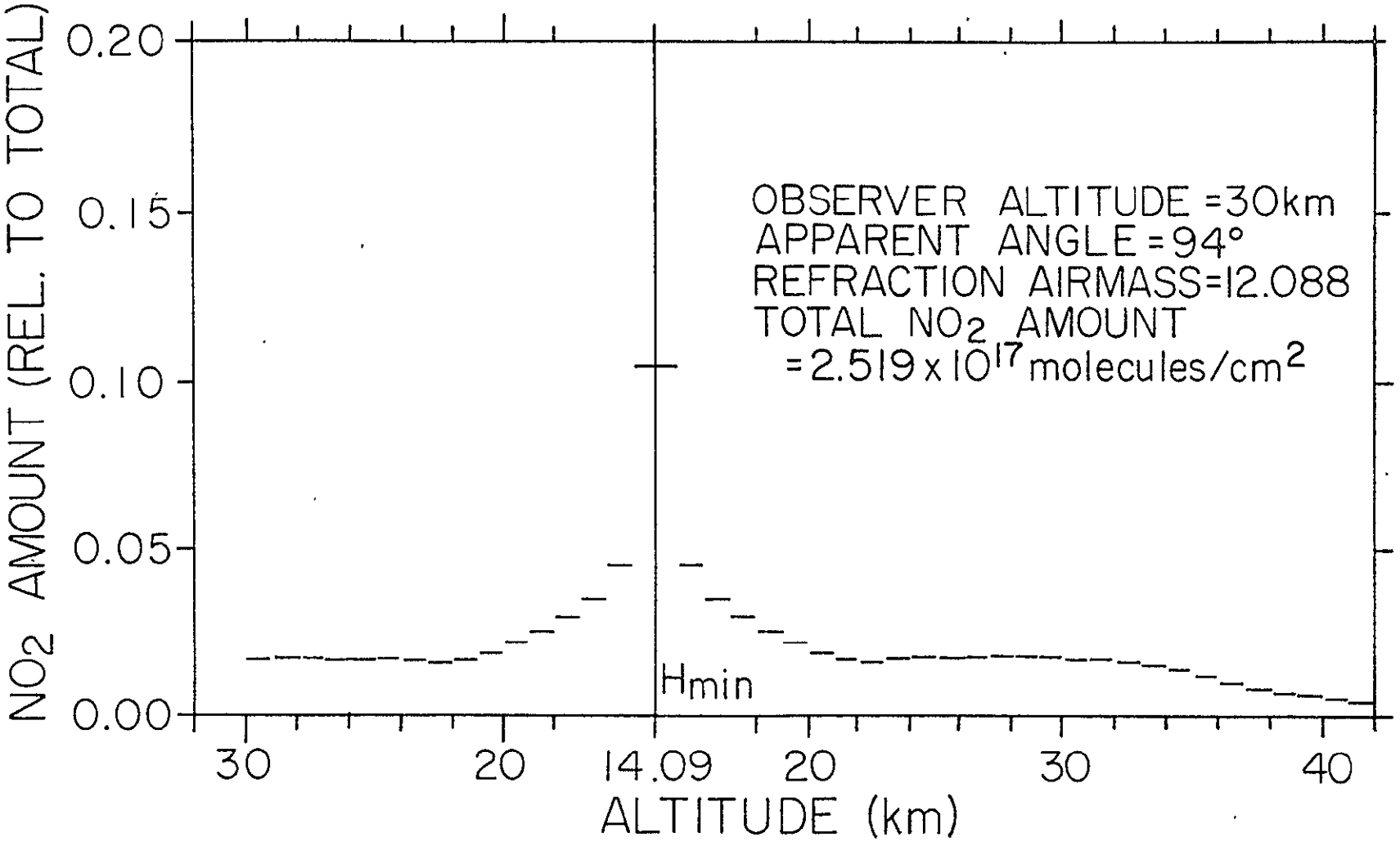

Figure 3. NO_2 distribution for a 94° path from 30 km altitude.