

ΑΣΤΡΟΝΟΜΙΑ.— **II. Physical Parameters of the Upper Atmosphere of Venus, Computed for Different Chemical Compositions of $\text{CO}_2 \cdot \text{CO}_2^+$** , by *Constantin J. Macris - Basil Ch. Petropoulos* *.

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A B S T R A C T

In this paper we give the physical parameters, for different chemical compositions containing $\text{CO}_2 \cdot \text{CO}_2^+$, computed function of the altitude in the Venus atmosphere. The above physical parameters can be used to study the upper atmosphere of Venus where $\text{CO}_2 \cdot \text{CO}_2^+$ is probably formed from the photoionisation of CO_2 . The U.V haze, that appears between the altitudes 60-80 km, in the Venus upper atmosphere, has attributed by Aikin, to the formation of $\text{CO}_2 \cdot \text{CO}_2^+$. The computed physical parameters, can be used to study the kinetic reactions of the $\text{CO}_2 \cdot \text{CO}_2^+$ in this haze. We have used for the above computation the measurements of Venera 9 and 10 and compared the results of pressures and densities, to the measured values from Venera 9 and 10 and Pioneer.

1. INTRODUCTION

In a preceding work (Macris - Petropoulos, 1979) we computed the physical parameters of the lower atmosphere of Venus, for different chemical compositions containing SO_2 . In this work we have computed the physical parameters of the upper atmosphere of Venus, for different chemical compositions containing $\text{CO}_2 \cdot \text{CO}_2^+$.

The atmosphere of Venus has high density, from 0 to 50 km altitude (lower atmosphere), where there is thick cloud formation, probably of H_2SO_4 and low density above 50 km (upper atmosphere).

* Κ. Ι. ΜΑΚΡΗ - Β. Χ. ΠΕΤΡΟΠΟΥΛΟΥ, Αἱ φυσικαὶ παράμετροι τῆς ἀνωτέρας ἀτμοσφαιρᾶς τῆς Ἀφροδίτης διὰ διαφόρους χημικὰς συνθέσεις αἱ ὁποῖαι περιέχουν $\text{CO}_2 \cdot \text{CO}_2^+$.

2. CHEMICAL COMPOSITIONS AND COMPUTED PHYSICAL PARAMETERS FOR THE UPPER ATMOSPHERE OF VENUS

The chemical composition of the upper atmosphere is different from that of the lower atmosphere. This is attributed to the phenomena of ionisation and photoionisation of CO_2 which take place at high altitudes.

The lower atmosphere contains a small quantity of SO_2 as the Pioneer measurements have shown (Oyama, 1979), while in the upper atmosphere there are probably aerosoles which create a haze at the altitudes of 70-80 km, as has been observed by Mariner 10 (Dunne et al, 1978).

The composition of these aerosoles is still unknown, but Aikin (1972) has made the assumption that they are cluster ions of the type $\text{CO}_2^+ \cdot \text{CO}_2$. The pressures and temperatures conditions at these altitudes and the photoionisation reactions favour the formation of these molecules (Bauer, 1973). But the existence of $\text{CO}_2 \cdot \text{CO}_2^+$ can not be detected with the instruments that have been used by the different spacecrafts, which have explored, the atmosphere of Venus.

However, it is possible to measure the quantity of CO_2 and CO_2^+ at these altitudes. The latest measurements of Pioneer have shown that the principal component of the upper atmosphere below the altitude of 155 km (Kundsen, 1979) and CO_2^+ is abundant between the altitudes of 155 and 180 km (Kundsen, 1979).

To verify Aikin's assumption, we have computed in preceding work (Macris, Petropoulos, 1978) the pressure and the density of the atmosphere of Venus for the chemical compositions of table I.

T A B L E 1

Chemical compositions for the atmosphere of Venus.

1	97 % CO_2 ,	3 % N_2		
2	94 % CO_2 ,	3 % N_2 ,	1,5 % H_2O ,	1,5 % $\text{CO}_2 \cdot \text{CO}_2^+$
3	94 % CO_2 ,	3 % N_2 ,	0,5 % H_2O ,	2,5 % $\text{CO}_2 \cdot \text{CO}_2^+$

In this work we have computed for the three chemical compositions of table I the following physical parameters of the atmosphere of Venus (pressure, density, number density, speed of sound, density scale, mean free path, viscosity, pressure scale, mean particle velocity, collision frequency, columnar mass) from 0 to 200 km. The computed pressures and densities are comparable to those measured by Venera 9 and 10 and recently by Pioneer (Shapiro et al, 1979).

For this computation we have used the Pitts (1968) programme, which is based on the assumption of the hydrostatic model and we have accepted that is valid for the homogeneous atmosphere of Venus, which contains a great quantity of CO_2 , below the altitude of 180 km (Niemann, 1979, and Kundsén, 1979).

For the above computation we have used, apart from the chemical composition of table I, the following data:

1. The temperature near the surface $T_s = 758^\circ\text{K}$ (Venera 9) and $T_s = 738^\circ\text{K}$ (Venera 10), (Keldysh 1979). The pressure near the surface $P_s = 90190\text{ mb}$ (Keldysh 1977) measured by Venera 9 and 10.

2. The distribution of the temperature (table 2, 3, 4) which has been measured a) between 0 - 40 km by Venera 4 to 10 (Keldysh, 1977), b) between 40 - 90 km by Venera 9 and 10 (Kolosov, 1978) and c) between 80 - 200 km by Mariner 5 and 10 (Fjeldbo, 1971).

3. The radius of Venus $R_o = 6050\text{ km}$ which has been measured by Mariner 5 (Fjeldbo, 1971).

4. The distribution of the molecular weight from 0 to 150 km computed from the chemical compositions of table 1 and from 150 km to 200 km calculated by Marov (1972). The computed physical parameters are given in tables 2, 3, 4.

3. COMPARISON OF THE COMPUTED VALUES OF PRESSURE AND DENSITY WITH THOSE MEASURED BY VENERA 9

As we have noted in our preceding work (Macris, Petropoulos, 1978) the computed number densities and pressures based in data of the chemical composition 1 (table 1), coincide with the measurements of Venera

9 and 10 (Kolosov, 1978) between 44 - 76 km and for the chemical composition 2 between 40 - 50 km altitude.

The computed number densities and pressures with the chemical compositions 2 and 3 of table 1, have been compared with the measurements of Venera 9 and 10 between 80 - 90 km in tables 5 and 6 respectively. The values of number density measured by Venera 9 and 10 for altitudes 80 - 90 km, are within the computed values computed with the chemical composition (2) and (3) and containing $\text{CO}_2 \cdot \text{CO}_2^+$, 1,5 and 2,5%. This is also, does true for measured pressures which are within the values of the computed pressures only for the altitudes 80, 84, 88 and 90 km while for the altitude 82 and 86 km the measured values fall computed.

The above anomalies can probably be attributed either to the inversions of temperatures at the above altitudes, or to changes of the electronic density, Mariner 10 has found distinct temperature inversions for a short distance with increasing height (Dunne et al, 1978). We can conclude that if $\text{CO}_2 \cdot \text{CO}_2^+$ is formed at these altitudes its quantity is between 1,5% and 2,5%.

Between the altitudes 90 - 150 km Venera 9 and 10 and Pioneer did not measure the number density and the pressure, and it is not possible to make comparison with the computed values. However between the altitudes 150 - 200 km the computed values of density can be compared with the recent measurements of Pioneer (Shapiro et al, 1979). The computed values of density with the chemical compositions of table 1 are greater than those measured by Pioneer. These difference can be attributed to the fact that these measurements were realised at different periods of time (Venera 9 and 10 in 1976 and Pioneer in 1979).

4. CONCLUSIONS

The upper atmosphere of Venus (50 - 180 km) is homogeneous and contains a great quantity of CO_2 and CO_2^+ with probable formation of $\text{CO}_2 \cdot \text{CO}_2^+$ in a percentage quantity between 1,5% - 2,5%.

If we take into account the values of temperatures and densities of tables 2, 3 and 4 we can separate the atmosphere of Venus into the following parts :

- 1) Lower atmosphere (0 - 50 km)
- 2) Middle and upper atmosphere (50 - 180 km)
- 3) Upper thermosphere above 180 km altitude.

The ionopause extends between 400 - 1000 km altitude (Kundsen, 1979). The percentage of $\text{CO}_2 \cdot \text{CO}_2^+$ in the atmosphere depends mainly on the ionisation of the atmosphere and the intensity of solar activity. Aikin (1973) concluded that for this region $\text{CO}_2 \cdot \text{CO}_2^+$ is created within the layers E (125 km) and F₁ (160 km) (Bauer, 1973) which are caused by the maximum of electronic density and are due to the ionisation of CO_2 and the photochemical equilibrium of CO_2^+ (Bauer, 1973). These molecules are thereafter precipitated in the form of aerosoles and form the haze. Consequently the composition of the atmosphere of Venus contains $\text{CO}_2 \cdot \text{CO}_2^+$ at the height of the haze, and its quantity depends on the value of the maximum electronic density, which changes as a function of solar activity.

The values of pressures and densities for different percentage chemical compositions of $\text{CO}_2 \cdot \text{CO}_2^+$, based on Venera 9 and Venera 10 measurements are given in tables 2, 3, 4 and correspond to values of solar activity near the minimum (1976). These parameters can be used to study the kinetic of the reactions of formation of $\text{CO}_2 \cdot \text{CO}_2^+$. The recent measurements of Venera 11 and 12 and Pioneer were obtained near the maximum of solar activity (1979).

T A B L E 2

Model of the venus atmosphere based of the data of Venera 9 measurements
construction parameters.

SURFACE PRESSURE =	90190.00 MB	SURFACE TEMPERATURE =	758.00 K	SURFACE DENSITY =	0.623E-01 GM/CC
BASE CF EXOSPHERE =	4000.00(KM)	MOLECULAR WEIGHT =	43.531	SURFACE GRAVITY =	887.600 CM/SEC/SEC
RADIUS OF VENUS =	6050.00(KM)	PERCENT CO ₂	0.0	PERCENT CO ₂	97.000
PERCENT OXYGEN =	0.0	PERCENT ARGON =	0.0	PERCENT NEON =	0.0
PERCENT NITROGEN =	3.000	PERCENT HELIUM =	0.0	PERCENT WATER =	0.0
PERCENT CO =	0.0	PERCENT SO ₂	0.0		

TEMPERATURE AND MOLECULAR WEIGHT DISTRIBUTION

AT	5.00	GEOM KM	TEMPERATURE=	716.90 K	AND MOLECULAR	WEIGHT=	43.51999
AT	10.00	GEOM KM	TEMPERATURE=	676.40 K	AND MOLECULAR	WEIGHT=	43.51999
AT	15.00	GEOM KM	TEMPERATURE=	635.10 K	AND MOLECULAR	WEIGHT=	43.51999
AT	20.00	GEOM KM	TEMPERATURE=	593.20 K	AND MOLECULAR	WEIGHT=	43.51999
AT	25.00	GEOM KM	TEMPERATURE=	550.50 K	AND MOLECULAR	WEIGHT=	43.51999
AT	30.00	GEOM KM	TEMPERATURE=	507.00 K	AND MOLECULAR	WEIGHT=	43.51999
AT	35.00	GEOM KM	TEMPERATURE=	462.40 K	AND MOLECULAR	WEIGHT=	43.51999
AT	40.00	GEOM KM	TEMPERATURE=	426.50 K	AND MOLECULAR	WEIGHT=	43.51999
AT	46.00	GEOM KM	TEMPERATURE=	406.00 K	AND MOLECULAR	WEIGHT=	43.51999
AT	48.00	GEOM KM	TEMPERATURE=	378.00 K	AND MOLECULAR	WEIGHT=	43.51999
AT	52.00	GEOM KM	TEMPERATURE=	343.00 K	AND MOLECULAR	WEIGHT=	43.51999
AT	56.00	GEOM KM	TEMPERATURE=	303.00 K	AND MOLECULAR	WEIGHT=	43.51999
AT	60.00	GEOM KM	TEMPERATURE=	269.00 K	AND MOLECULAR	WEIGHT=	43.51999
AT	64.00	GEOM KM	TEMPERATURE=	254.00 K	AND MOLECULAR	WEIGHT=	43.51999
AT	68.00	GEOM KM	TEMPERATURE=	238.00 K	AND MOLECULAR	WEIGHT=	43.51999
AT	72.00	GEOM KM	TEMPERATURE=	222.00 K	AND MOLECULAR	WEIGHT=	43.51999
AT	76.00	GEOM KM	TEMPERATURE=	207.00 K	AND MOLECULAR	WEIGHT=	42.51999
AT	80.00	GEOM KM	TEMPERATURE=	197.00 K	AND MOLECULAR	WEIGHT=	43.51999
AT	84.00	GEOM KM	TEMPERATURE=	184.00 K	AND MOLECULAR	WEIGHT=	43.51999
AT	88.00	GEOM KM	TEMPERATURE=	171.00 K	AND MOLECULAR	WEIGHT=	43.51999
AT	90.00	GEOM KM	TEMPERATURE=	175.00 K	AND MOLECULAR	WEIGHT=	43.51999
AT	100.00	GEOM KM	TEMPERATURE=	171.40 K	AND MOLECULAR	WEIGHT=	43.51999
AT	110.00	GEOM KM	TEMPERATURE=	204.80 K	AND MOLECULAR	WEIGHT=	43.51999
AT	120.00	GEOM KM	TEMPERATURE=	262.80 K	AND MOLECULAR	WEIGHT=	43.51999
AT	130.00	GEOM KM	TEMPERATURE=	340.30 K	AND MOLECULAR	WEIGHT=	43.51999
AT	140.00	GEOM KM	TEMPERATURE=	426.80 K	AND MOLECULAR	WEIGHT=	43.51999
AT	150.00	GEOM KM	TEMPERATURE=	510.30 K	AND MOLECULAR	WEIGHT=	42.06000
AT	170.00	GEOM KM	TEMPERATURE=	625.10 K	AND MOLECULAR	WEIGHT=	39.39999
AT	180.00	GEOM KM	TEMPERATURE=	646.30 K	AND MOLECULAR	WEIGHT=	37.70000
AT	200.00	GEOP KM	TEMPERATURE=	650.00 K	AND MOLECULAR	WEIGHT=	33.59999

Table 2 (continued)
CALCULATED QUANTITIES

HEIGHT (KM)	TEMP (K)	PRESSURE (MB)	DENSITY (GM/CC)	SPEED OF SOUND (M/SEC)	MOLECULAR WEIGHT	DENS SCALE KM	NUMBER DENSITY (PER CC)	MEAN FREE PATH (M)	VIS- COSITY (E+5)	PRES SCALE (KM)	MEAN VELOCITY (M/SEC)	COLL FREQ (PER SEC)	COLJMNAR MASS
0	758.0	9.02E 04	6.23E-02	418.	43.5	19.82	8.62E 20	1.68E-09	3.18	16.31	607.	3.62E 11	0.0
1	749.8	8.48E 04	5.92E-02	415.	43.5	19.59	8.19E 20	1.77E-09	3.17	16.14	604.	3.42E 11	6.073E 03
2	741.6	7.97E 04	5.63E-02	413.	43.5	19.39	7.78E 20	1.86E-09	3.15	15.97	601.	3.23E 11	1.184E 04
3	733.3	7.48E 04	5.34E-02	411.	43.5	19.18	7.39E 20	1.96E-09	3.13	15.80	597.	3.05E 11	1.733E 04
4	725.1	7.02E 04	5.07E-02	408.	43.5	18.97	7.01E 20	2.06E-09	3.11	15.63	594.	2.88E 11	2.253E 04
5	716.9	6.58E 04	4.81E-02	406.	43.5	18.76	6.65E 20	2.18E-09	3.10	15.46	591.	2.71E 11	2.745E 04
6	708.8	6.17E 04	4.56E-02	404.	43.5	18.52	6.30E 20	2.30E-09	3.08	15.29	587.	2.56E 11	3.214E 04
7	700.7	5.78E 04	4.31E-02	402.	43.5	18.32	5.97E 20	2.42E-09	3.06	15.12	584.	2.41E 11	3.658E 04
8	692.6	5.40E 04	4.08E-02	399.	43.5	18.11	5.65E 20	2.56E-09	3.03	14.95	580.	2.27E 11	4.077E 04
9	684.5	5.05E 04	3.86E-02	397.	43.5	17.91	5.35E 20	2.71E-09	3.00	14.78	577.	2.13E 11	4.475E 04
10	676.4	4.72E 04	3.65E-02	395.	43.5	17.70	5.05E 20	2.86E-09	2.97	14.61	574.	2.00E 11	4.850E 04
11	668.1	4.41E 04	3.45E-02	393.	43.5	17.57	4.78E 20	3.03E-09	2.95	14.43	570.	1.88E 11	5.205E 04
12	659.9	4.11E 04	3.26E-02	390.	43.5	17.36	4.51E 20	3.21E-09	2.92	14.26	567.	1.77E 11	5.541E 04
13	651.6	3.83E 04	3.08E-02	388.	43.5	17.15	4.26E 20	3.40E-09	2.89	14.09	563.	1.66E 11	5.857E 04
14	643.4	3.57E 04	2.90E-02	386.	43.5	16.94	4.01E 20	3.61E-09	2.86	13.91	559.	1.55E 11	6.155E 04
15	635.1	3.32E 04	2.73E-02	383.	43.5	16.72	3.78E 20	3.83E-09	2.83	13.74	556.	1.45E 11	6.438E 04
16	626.7	3.08E 04	2.57E-02	381.	43.5	16.57	3.56E 20	4.06E-09	2.80	13.56	552.	1.36E 11	6.703E 04
17	618.3	2.86E 04	2.42E-02	379.	43.5	16.35	3.35E 20	4.32E-09	2.77	13.38	548.	1.27E 11	6.953E 04
18	610.0	2.65E 04	2.28E-02	376.	43.5	16.13	3.15E 20	4.59E-09	2.74	13.21	545.	1.19E 11	7.188E 04
19	601.6	2.46E 04	2.14E-02	374.	43.5	15.92	2.96E 20	4.89E-09	2.71	13.03	541.	1.11E 11	7.408E 04
20	593.2	2.28E 04	2.01E-02	371.	43.5	15.70	2.78E 20	5.21E-09	2.69	12.85	537.	1.03E 11	7.615E 04
21	584.7	2.10E 04	1.88E-02	369.	43.5	15.55	2.61E 20	5.55E-09	2.66	12.67	533.	9.61E 10	7.810E 04
22	576.1	1.94E 04	1.77E-02	366.	43.5	15.33	2.44E 20	5.92E-09	2.63	12.49	529.	8.94E 10	7.993E 04
23	567.6	1.79E 04	1.65E-02	364.	43.5	15.11	2.29E 20	6.32E-09	2.60	12.31	525.	8.31E 10	8.164E 04
24	559.0	1.65E 04	1.55E-02	361.	43.5	14.89	2.14E 20	6.76E-09	2.57	12.13	522.	7.72E 10	8.324E 04
25	550.5	1.52E 04	1.45E-02	359.	43.5	14.66	2.00E 20	7.23E-09	2.54	11.95	518.	7.16E 10	8.473E 04
26	541.8	1.40E 04	1.35E-02	356.	43.5	14.50	1.87E 20	7.74E-09	2.51	11.76	513.	6.63E 10	8.613E 04
27	533.1	1.28E 04	1.26E-02	353.	43.5	14.27	1.74E 20	8.30E-09	2.48	11.58	509.	6.13E 10	8.743E 04
28	524.4	1.18E 04	1.17E-02	351.	43.5	14.05	1.62E 20	8.91E-09	2.45	11.39	505.	5.67E 10	8.865E 04
29	515.7	1.08E 04	1.09E-02	348.	43.5	13.82	1.51E 20	9.57E-09	2.42	11.21	501.	5.23E 10	8.978E 04
30	507.0	9.84E 03	1.02E-02	345.	43.5	13.59	1.41E 20	1.03E-08	2.39	11.02	497.	4.82E 10	9.083E 04
31	498.1	8.98E 03	9.43E-03	342.	43.5	13.44	1.31E 20	1.11E-08	2.32	10.83	492.	4.44E 10	9.181E 04
32	489.2	8.18E 03	8.75E-03	340.	43.5	13.20	1.21E 20	1.19E-08	2.32	10.64	488.	4.08E 10	9.272E 04
33	480.2	7.44E 03	8.11E-03	337.	43.5	12.97	1.12E 20	1.29E-08	2.28	10.45	483.	3.75E 10	9.356E 04
34	471.3	6.75E 03	7.50E-03	334.	43.5	12.73	1.04E 20	1.39E-08	2.25	10.26	479.	3.43E 10	9.434E 04
35	462.4	6.12E 03	6.93E-03	331.	43.5	12.49	9.59E 19	1.51E-08	2.21	10.07	474.	3.14E 10	9.507E 04
36	457.2	5.54E 03	6.34E-03	328.	43.5	11.23	8.78E 19	1.65E-08	2.19	9.96	472.	2.86E 10	9.573E 04
37	452.0	5.01E 03	5.80E-03	325.	43.5	11.10	8.02E 19	1.80E-08	2.17	9.85	469.	2.60E 10	9.633E 04
38	446.9	4.52E 03	5.30E-03	326.	43.5	10.98	7.33E 19	1.97E-08	2.15	9.74	466.	2.36E 10	9.689E 04
39	441.7	4.08E 03	4.83E-03	324.	43.5	10.85	6.69E 19	2.16E-08	2.13	9.63	464.	2.14E 10	9.739E 04
40	436.5	3.67E 03	4.41E-03	322.	43.5	10.73	6.10E 19	2.37E-08	2.10	9.52	461.	1.94E 10	9.786E 04
41	428.9	3.30E 03	4.03E-03	320.	43.5	11.22	5.58E 19	2.59E-08	2.07	9.36	457.	1.76E 10	9.828E 04
42	421.2	2.97E 03	3.69E-03	317.	43.5	11.03	5.10E 19	2.84E-08	2.04	9.19	453.	1.60E 10	9.866E 04
43	413.6	2.66E 03	3.36E-03	314.	43.5	10.83	4.66E 19	3.11E-08	2.01	9.03	449.	1.44E 10	9.902E 04
44	406.0	2.38E 03	3.06E-03	312.	43.5	10.64	4.24E 19	3.41E-08	1.98	8.87	444.	1.30E 10	9.934E 04
45	399.0	2.12E 03	2.78E-03	309.	43.5	10.29	3.85E 19	3.76E-08	1.95	8.72	441.	1.17E 10	9.963E 04

Table 2 (continued)

46	392.0	1.89E 03	2.52E-03	307.	43.5	10.11	3.49E 19	4.14E-08	1.92	8.57	437.	1.05E 10	0.999E 04
47	385.0	1.68E 03	2.28E-03	304.	43.5	9.94	3.16E 19	4.59E-08	1.88	8.42	433.	9.45E 09	1.001E 05
48	378.0	1.49E 03	2.06E-03	302.	43.5	9.76	2.86E 19	5.07E-08	1.85	8.27	429.	8.46E 09	1.001E 05
49	369.2	1.32E 03	1.87E-03	299.	43.5	9.99	2.59E 19	5.60E-08	1.81	8.08	424.	7.57E 09	1.005E 05
50	361.5	1.16E 03	1.69E-03	295.	43.5	9.52	2.34E 19	6.19E-08	1.76	7.89	419.	6.76E 09	1.007E 05
51	351.7	1.02E 03	1.52E-03	292.	43.5	9.22	2.11E 19	6.87E-08	1.72	7.70	414.	6.02E 09	1.009E 05
52	343.0	8.97E 02	1.37E-03	289.	43.5	9.29	1.89E 19	7.64E-08	1.68	7.51	408.	5.35E 09	1.011E 05
53	333.0	7.84E 02	1.23E-03	285.	43.5	9.34	1.70E 19	8.49E-08	1.64	7.29	402.	4.74E 09	1.011E 05
54	323.0	6.82E 02	1.10E-03	281.	43.5	9.06	1.53E 19	9.47E-08	1.59	7.08	396.	4.19E 09	1.013E 05
55	313.0	5.91E 02	9.88E-04	277.	43.5	8.79	1.37E 19	1.06E-07	1.55	6.86	390.	3.69E 09	1.014E 05
56	303.0	5.09E 02	8.80E-04	273.	43.5	8.51	1.22E 19	1.19E-07	1.50	6.64	384.	3.23E 09	1.015E 05
57	294.5	4.37E 02	7.77E-04	270.	43.5	7.94	1.08E 19	1.35E-07	1.46	6.46	379.	2.81E 09	1.016E 05
58	286.0	3.74E 02	6.84E-04	266.	43.5	7.71	9.66E 18	1.53E-07	1.42	6.27	373.	2.44E 09	1.015E 05
59	277.5	3.18E 02	6.00E-04	263.	43.5	7.49	8.30E 18	1.74E-07	1.38	6.09	367.	2.11E 09	1.017E 05
60	269.0	2.69E 02	5.23E-04	259.	43.5	7.26	7.24E 18	2.00E-07	1.33	5.91	362.	1.81E 09	1.017E 05
61	265.2	2.27E 02	4.48E-04	257.	43.5	6.25	6.20E 18	2.34E-07	1.25	5.82	359.	1.54E 09	1.018E 05
62	261.5	1.91E 02	3.82E-04	256.	43.5	6.26	5.29E 18	2.74E-07	1.20	5.74	357.	1.30E 09	1.019E 05
63	257.7	1.60E 02	3.25E-04	254.	43.5	6.17	4.50E 18	3.22E-07	1.28	5.66	354.	1.10E 09	1.019E 05
64	254.0	1.34E 02	2.76E-04	252.	43.5	6.08	3.82E 18	3.79E-07	1.26	5.58	352.	9.29E 08	1.019E 05
65	250.0	1.12E 02	2.34E-04	251.	43.5	5.83	3.24E 18	4.46E-07	1.25	5.50	349.	7.87E 08	1.019E 05
66	246.0	9.32E 01	1.98E-04	249.	43.5	5.93	2.74E 18	5.28E-07	1.23	5.41	346.	6.56E 08	1.019E 05
67	242.0	7.73E 01	1.67E-04	247.	43.5	5.84	2.31E 18	6.25E-07	1.21	5.32	343.	5.49E 08	1.020E 05
68	238.0	6.40E 01	1.41E-04	245.	43.5	5.74	1.95E 18	7.43E-07	1.19	5.24	340.	4.58E 08	1.020E 05
69	234.0	5.28E 01	1.18E-04	243.	43.5	5.65	1.63E 18	8.86E-07	1.17	5.15	337.	3.81E 08	1.020E 05
70	230.0	4.34E 01	9.86E-05	242.	43.5	5.56	1.37E 18	1.06E-06	1.16	5.07	335.	3.16E 08	1.020E 05
71	226.0	3.56E 01	8.24E-05	240.	43.5	5.46	1.14E 18	1.27E-06	1.14	4.98	332.	2.61E 08	1.020E 05
72	222.0	2.90E 01	6.85E-05	238.	43.5	5.37	9.48E 17	1.53E-06	1.12	4.89	329.	2.15E 08	1.020E 05
73	218.2	2.37E 01	5.64E-05	237.	43.0	5.12	7.85E 17	1.84E-06	1.10	4.84	327.	1.77E 08	1.020E 05
74	214.5	1.92E 01	4.63E-05	235.	43.0	5.07	6.49E 17	2.23E-06	1.09	4.79	325.	1.46E 08	1.020E 05
75	210.7	1.56E 01	3.80E-05	234.	42.8	5.01	5.35E 17	2.70E-06	1.07	4.73	323.	1.19E 08	1.020E 05
76	207.0	1.26E 01	3.11E-05	233.	42.5	4.96	4.41E 17	3.29E-06	1.06	4.68	321.	9.77E 07	1.020E 05
77	204.5	1.01E 01	2.55E-05	231.	42.8	5.01	3.59E 17	4.03E-06	1.05	4.59	318.	7.90E 07	1.020E 05
78	202.0	8.15E 00	2.09E-05	229.	43.0	4.92	2.92E 17	4.94E-06	1.04	4.51	315.	6.36E 07	1.020E 05
79	199.5	6.51E 00	1.70E-05	227.	43.3	4.83	2.36E 17	6.12E-06	1.02	4.43	312.	5.11E 07	1.020E 05
80	197.0	5.19E 00	1.38E-05	225.	43.5	4.74	1.91E 17	7.59E-06	1.00	4.35	310.	4.08E 07	1.021E 05
81	193.7	4.11E 00	1.11E-05	224.	43.5	4.61	1.54E 17	9.41E-06	0.98	4.28	307.	3.28E 07	1.021E 05
82	190.5	3.25E 00	8.93E-06	222.	43.5	4.54	1.24E 17	1.17E-05	0.96	4.21	304.	2.60E 07	1.021E 05
83	187.2	2.56E 00	7.15E-06	220.	43.5	4.46	9.90E 16	1.46E-05	0.93	4.14	302.	2.06E 07	1.021E 05
84	184.0	2.01E 00	5.71E-06	218.	43.5	4.39	7.90E 16	1.83E-05	0.91	4.07	299.	1.63E 07	1.021E 05
85	180.7	1.57E 00	4.53E-06	216.	43.5	4.31	6.28E 16	2.31E-05	0.89	4.00	297.	1.29E 07	1.021E 05
86	177.5	1.22E 00	3.59E-06	215.	43.5	4.23	4.97E 16	2.91E-05	0.87	3.93	294.	1.01E 07	1.021E 05
87	174.2	9.41E-01	2.83E-06	213.	43.5	4.16	3.91E 16	3.70E-05	0.85	3.86	291.	7.87E 06	1.021E 05
88	171.0	7.25E-01	2.22E-06	211.	43.5	4.08	3.07E 16	4.71E-05	0.83	3.79	288.	6.12E 06	1.021E 05
89	173.0	5.57E-01	1.69E-06	212.	43.5	3.67	2.33E 16	6.20E-05	0.84	3.83	290.	4.68E 06	1.021E 05
90	175.0	4.30E-01	1.29E-06	213.	43.5	3.71	1.78E 16	8.13E-05	0.85	3.88	292.	3.59E 06	1.021E 05
91	174.6	3.32E-01	9.95E-07	213.	43.5	3.90	1.38E 16	1.05E-04	0.85	3.87	291.	2.78E 06	1.021E 05
92	174.3	2.57E-01	7.71E-07	213.	43.5	3.90	1.07E 16	1.36E-04	0.85	3.87	291.	2.15E 06	1.021E 05
93	173.9	1.98E-01	5.96E-07	212.	43.5	3.89	8.25E 15	1.75E-04	0.85	3.86	291.	1.66E 06	1.021E 05
94	173.6	1.53E-01	4.61E-07	212.	43.5	3.88	6.38E 15	2.27E-04	0.84	3.85	291.	1.28E 06	1.021E 05
95	173.2	1.18E-01	3.56E-07	212.	43.5	3.88	4.93E 15	2.94E-04	0.84	3.85	290.	9.89E 05	1.021E 05
96	172.8	9.09E-02	2.75E-07	212.	43.5	3.87	3.81E 15	3.80E-04	0.84	3.84	290.	7.63E 05	1.021E 05
97	172.5	7.00E-02	2.13E-07	212.	43.5	3.86	2.94E 15	4.92E-04	0.84	3.83	290.	5.89E 05	1.021E 05

Table 2 (continued)

98	172.1	5.39E-02	1.64E-07	211.	43.5	3.86	2.7E 15	6.38E-04	C.84	3.83	289.	4.54E 05	1.021E 05
99	171.8	4.15E-02	1.27E-07	211.	43.5	3.85	1.75E 15	8.25E-04	0.83	3.82	289.	3.50E 05	1.021E 05
100	171.4	3.20E-02	9.76E-08	211.	43.5	3.84	1.35E 15	1.07E-03	0.83	3.81	289.	2.69E 05	1.021E 05
101	174.7	2.46E-02	7.39E-08	213.	43.5	3.62	1.02E 15	1.42E-03	0.85	3.89	292.	2.06E 05	1.021E 05
102	178.1	1.91E-02	5.61E-08	215.	43.5	3.69	7.77E 14	1.86E-03	0.87	3.89	294.	1.58E 05	1.021E 05
103	181.4	1.49E-02	4.29E-08	217.	43.5	3.76	5.95E 14	2.44E-03	0.90	4.04	297.	1.22E 05	1.021E 05
104	184.8	1.16E-02	3.30E-08	219.	43.5	3.83	4.56E 14	3.17E-03	0.92	4.11	300.	9.45E 04	1.021E 05
105	188.1	9.15E-03	2.59E-08	220.	43.5	3.90	3.52E 14	4.11E-03	0.94	4.19	303.	7.36E 04	1.021E 05
106	191.5	7.22E-03	1.97E-08	222.	43.5	3.97	2.73E 14	5.30E-03	0.96	4.27	305.	5.76E 04	1.021E 05
107	194.8	5.75E-03	1.54E-08	224.	43.5	4.04	2.13E 14	6.80E-03	0.99	4.34	308.	4.53E 04	1.021E 05
108	198.1	4.56E-03	1.20E-08	226.	43.5	4.11	1.67E 14	8.69E-03	1.01	4.42	310.	3.57E 04	1.021E 05
109	201.5	3.64E-03	9.46E-09	228.	43.5	4.18	1.31E 14	1.11E-02	1.03	4.49	313.	2.83E 04	1.021E 05
110	204.8	2.92E-03	7.45E-09	229.	43.5	4.25	1.03E 14	1.40E-02	1.05	4.57	316.	2.25E 04	1.021E 05
111	210.6	2.35E-03	5.85E-09	232.	43.5	4.16	8.09E 13	1.79E-02	1.07	4.70	320.	1.79E 04	1.021E 05
112	216.4	1.91E-03	4.61E-09	235.	43.5	4.28	6.59E 13	2.27E-02	1.10	4.83	324.	1.43E 04	1.021E 05
113	222.2	1.56E-03	3.66E-09	238.	43.5	4.39	5.07E 13	2.85E-02	1.12	4.96	329.	1.15E 04	1.021E 05
114	228.0	1.27E-03	2.93E-09	241.	43.5	4.51	4.05E 13	3.57E-02	1.15	5.09	333.	9.32E 03	1.021E 05
115	233.8	1.05E-03	2.35E-09	243.	43.5	4.63	3.25E 13	4.45E-02	1.17	5.23	337.	7.58E 03	1.021E 05
116	239.6	8.69E-04	1.90E-09	246.	43.5	4.74	2.63E 13	5.57E-02	1.20	5.36	341.	6.20E 03	1.021E 05
117	245.4	7.23E-04	1.54E-09	249.	43.5	4.86	2.13E 13	6.78E-02	1.22	5.49	346.	5.09E 03	1.021E 05
118	251.2	6.04E-04	1.26E-09	251.	43.5	4.98	1.74E 13	8.31E-02	1.25	5.62	350.	4.21E 03	1.021E 05
119	257.0	5.06E-04	1.03E-09	254.	43.5	5.09	1.43E 13	1.01E-01	1.28	5.75	354.	3.49E 03	1.021E 05
120	262.8	4.26E-04	8.49E-10	256.	43.5	5.21	1.18E 13	1.23E-01	1.31	5.88	358.	2.90E 03	1.021E 05
121	270.6	3.61E-04	6.98E-10	260.	43.5	5.16	9.66E 12	1.50E-01	1.34	6.06	363.	2.42E 03	1.021E 05
122	278.3	3.07E-04	5.77E-10	263.	43.5	5.31	7.98E 12	1.81E-01	1.38	6.23	368.	2.03E 03	1.021E 05
123	286.1	2.62E-04	4.79E-10	266.	43.5	5.46	6.63E 12	2.18E-01	1.42	6.41	373.	1.71E 03	1.021E 05
124	293.8	2.24E-04	4.00E-10	269.	43.5	5.61	5.53E 12	2.62E-01	1.46	6.59	378.	1.44E 03	1.021E 05
125	301.6	1.93E-04	3.35E-10	273.	43.5	5.76	4.64E 12	3.12E-01	1.50	6.76	383.	1.23E 03	1.021E 05
126	309.3	1.67E-04	2.82E-10	276.	43.5	5.91	3.91E 12	3.70E-01	1.53	6.94	388.	1.05E 03	1.021E 05
127	317.1	1.45E-04	2.39E-10	279.	43.5	6.06	3.31E 12	4.38E-01	1.56	7.11	393.	8.98E 02	1.021E 05
128	324.8	1.26E-04	2.03E-10	282.	43.5	6.21	2.81E 12	5.15E-01	1.60	7.29	398.	7.72E 02	1.021E 05
129	332.6	1.10E-04	1.73E-10	285.	43.5	6.36	2.40E 12	6.04E-01	1.63	7.47	402.	6.66E 02	1.021E 05
130	340.3	9.64E-05	1.48E-10	288.	43.5	6.51	2.05E 12	7.05E-01	1.67	7.64	407.	5.77E 02	1.021E 05
131	349.0	8.47E-05	1.27E-10	291.	43.5	6.56	1.76E 12	8.23E-01	1.71	7.84	411.	5.01E 02	1.021E 05
132	357.6	7.47E-05	1.09E-10	294.	43.5	6.73	1.51E 12	9.57E-01	1.75	8.04	417.	4.36E 02	1.021E 05
133	366.3	6.60E-05	9.44E-11	298.	43.5	6.89	1.31E 12	1.11E 00	1.79	8.23	422.	3.81E 02	1.021E 05
134	374.9	5.86E-05	8.18E-11	301.9	43.5	7.06	1.13E 12	1.28E 00	1.83	8.43	427.	3.34E 02	1.021E 05
135	383.6	5.21E-05	7.11E-11	304.	43.5	7.22	9.84E 11	1.47E 00	1.88	8.63	432.	2.94E 02	1.021E 05
136	392.2	4.65E-05	6.20E-11	307.	43.5	7.39	8.58E 11	1.69E 00	1.92	8.83	437.	2.59E 02	1.021E 05
137	400.9	4.15E-05	5.42E-11	310.	43.5	7.55	7.50E 11	1.93E 00	1.96	9.02	442.	2.29E 02	1.021E 05
138	409.5	3.72E-05	4.76E-11	313.	43.5	7.72	6.58E 11	2.20E 00	2.00	9.22	446.	2.03E 02	1.021E 05
139	418.2	3.34E-05	4.18E-11	316.	43.5	7.88	5.94E 11	2.50E 00	2.03	9.42	451.	1.80E 02	1.021E 05
140	426.8	3.01E-05	3.69E-11	319.	43.5	8.05	5.11E 11	2.83E 00	2.07	9.62	456.	1.61E 02	1.021E 05
141	435.2	2.72E-05	3.26E-11	322.	43.4	8.06	4.52E 11	3.20E 00	2.10	9.84	461.	1.44E 02	1.021E 05
142	443.5	2.46E-05	2.88E-11	326.	43.2	8.23	4.01E 11	3.61E 00	2.13	10.07	466.	1.29E 02	1.021E 05
143	451.9	2.23E-05	2.55E-11	329.	43.1	8.41	3.57E 11	4.06E 00	2.17	10.30	471.	1.16E 02	1.021E 05
144	460.2	2.02E-05	2.27E-11	332.	42.9	8.58	3.18E 11	4.55E 00	2.20	10.52	476.	1.05E 02	1.021E 05
145	468.6	1.84E-05	2.05E-11	336.	42.8	8.76	2.85E 11	5.09E 00	2.24	10.76	482.	9.47E 01	1.021E 05
146	476.9	1.69E-05	1.81E-11	339.	42.6	8.94	2.55E 11	5.67E 00	2.27	10.99	487.	8.57E 01	1.021E 05
147	485.3	1.53E-05	1.62E-11	342.	42.5	9.12	2.29E 11	6.32E 00	2.31	11.22	492.	7.78E 01	1.021E 05
148	493.6	1.41E-05	1.45E-11	346.	42.4	9.30	2.06E 11	7.03E 00	2.34	11.46	497.	7.08E 01	1.021E 05
149	502.0	1.29E-05	1.30E-11	349.	42.2	9.48	1.86E 11	7.78E 00	2.38	11.70	502.	6.45E 01	1.021E 05

Table 2 (continued)

150	510.3	1.18E-05	1.17E-11	352.	42.1	9.66	1.68E 11	8.61E 00	2.40	11.94	507.	5.89E 01	1.021E 05
151	516.1	1.09E-05	1.06E-11	355.	4.89	10.32	1.39E 11	9.46E 00	2.42	12.11	510.	5.40E 01	1.021E 05
152	521.8	1.00E-05	9.67E-12	357.	4.8	10.47	1.39E 11	7.04E 01	2.44	12.29	514.	4.95E 01	1.021E 05
153	527.6	9.26E-06	8.80E-12	359.	41.7	10.61	1.27E 11	1.125E 01	2.46	12.47	518.	4.58E 01	1.021E 05
154	533.6	8.55E-06	8.01E-12	362.	41.5	10.75	1.16E 11	1.14E 01	2.48	12.65	521.	4.15E 01	1.021E 05
155	539.1	7.91E-06	7.30E-12	364.	43.4	10.90	1.06E 11	1.136E 01	2.50	12.83	525.	3.85E 01	1.021E 05
156	544.8	7.32E-06	6.67E-12	367.	43.3	11.04	9.73E 10	1.49E 01	2.52	13.01	529.	3.45E 01	1.021E 05
157	550.6	6.78E-06	6.09E-12	369.	41.1	11.19	8.92E 10	1.62E 01	2.54	13.20	532.	3.28E 01	1.021E 05
158	556.3	6.29E-06	5.57E-12	371.	41.0	11.33	8.19E 10	1.77E 01	2.56	13.38	536.	3.03E 01	1.021E 05
159	562.1	5.84E-06	5.11E-12	374.	40.9	11.48	7.53E 10	1.92E 01	2.58	13.57	540.	2.81E 01	1.021E 05
160	567.8	5.43E-06	4.68E-12	376.	40.7	11.63	6.92E 10	2.09E 01	2.60	13.76	543.	2.60E 01	1.021E 05
161	573.5	5.05E-06	4.30E-12	379.	40.6	11.77	6.38E 10	2.27E 01	2.62	13.95	547.	2.41E 01	1.021E 05
162	579.3	4.70E-06	3.95E-12	381.	40.5	11.92	5.88E 10	2.46E 01	2.64	14.14	551.	2.24E 01	1.021E 05
163	585.0	4.38E-06	3.63E-12	383.	40.3	12.07	5.43E 10	2.67E 01	2.66	14.33	554.	2.08E 01	1.021E 05
164	590.7	4.09E-06	3.35E-12	386.	40.2	12.22	5.01E 10	2.89E 01	2.68	14.52	558.	1.93E 01	1.021E 05
165	596.5	3.82E-06	3.09E-12	388.	40.1	12.37	4.64E 10	3.12E 01	2.70	14.72	561.	1.80E 01	1.021E 05
166	602.2	3.57E-06	2.85E-12	390.	39.9	12.52	4.29E 10	3.37E 01	2.72	14.91	565.	1.68E 01	1.021E 05
167	607.9	3.34E-06	2.63E-12	393.	39.8	12.67	3.98E 10	3.64E 01	2.74	15.11	569.	1.56E 01	1.021E 05
168	613.7	3.13E-06	2.43E-12	395.	39.7	12.83	3.69E 10	3.92E 01	2.76	15.31	572.	1.46E 01	1.021E 05
169	619.4	2.93E-06	2.25E-12	398.	39.5	12.98	3.43E 10	4.22E 01	2.78	15.51	576.	1.36E 01	1.021E 05
170	625.1	2.75E-06	2.08E-12	400.	39.4	13.13	3.19E 10	4.54E 01	2.80	15.71	580.	1.28E 01	1.021E 05
171	627.2	2.58E-06	1.94E-12	401.	39.2	14.12	2.96E 10	4.86E 01	2.80	15.84	582.	1.20E 01	1.021E 05
172	629.3	2.42E-06	1.81E-12	403.	39.1	14.22	2.79E 10	5.19E 01	2.81	15.96	584.	1.13E 01	1.021E 05
173	631.5	2.28E-06	1.69E-12	405.	38.9	14.32	2.61E 10	5.54E 01	2.82	16.09	586.	1.06E 01	1.021E 05
174	633.6	2.14E-06	1.57E-12	406.	38.7	14.42	2.45E 10	5.92E 01	2.83	16.22	589.	9.95E 00	1.021E 05
175	635.7	2.01E-06	1.47E-12	408.	38.4	14.52	2.29E 10	6.31E 01	2.83	16.35	591.	9.36E 00	1.021E 05
176	637.8	1.89E-06	1.37E-12	409.	38.4	14.63	2.15E 10	6.73E 01	2.84	16.49	593.	8.81E 00	1.021E 05
177	639.9	1.78E-06	1.28E-12	411.	38.2	14.73	2.02E 10	7.17E 01	2.85	16.62	595.	8.30E 00	1.021E 05
178	642.1	1.68E-06	1.20E-12	412.	38.0	14.83	1.89E 10	7.64E 01	2.85	16.75	598.	7.82E 00	1.021E 05
179	644.2	1.58E-06	1.12E-12	414.	37.9	14.94	1.78E 10	8.14E 01	2.86	16.89	600.	7.37E 00	1.021E 05
180	646.3	1.49E-06	1.05E-12	415.	37.7	15.04	1.67E 10	8.66E 01	2.87	17.03	602.	6.96E 00	1.021E 05
181	648.4	1.41E-06	9.82E-13	416.	37.5	15.94	1.58E 10	9.18E 01	2.87	17.11	604.	6.57E 00	1.021E 05
182	646.6	1.33E-06	9.23E-13	417.	37.4	16.00	1.49E 10	9.74E 01	2.87	17.19	605.	6.21E 00	1.021E 05
183	646.7	1.25E-06	8.67E-13	418.	37.2	16.07	1.40E 10	1.03E 02	2.87	17.27	606.	5.87E 00	1.021E 05
184	646.9	1.18E-06	8.15E-13	419.	37.1	16.14	1.32E 10	1.09E 02	2.87	17.35	608.	5.56E 00	1.021E 05
185	647.0	1.12E-06	7.66E-13	420.	36.9	16.20	1.25E 10	1.16E 02	2.87	17.43	609.	5.25E 00	1.021E 05
186	647.1	1.05E-06	7.20E-13	421.	36.8	16.27	1.18E 10	1.23E 02	2.87	17.51	610.	4.97E 00	1.021E 05
187	647.3	9.95E-07	6.77E-13	422.	36.6	16.34	1.11E 10	1.30E 02	2.87	17.59	612.	4.71E 00	1.021E 05
188	647.4	9.40E-07	6.37E-13	423.	36.5	16.40	1.05E 10	1.38E 02	2.87	17.68	613.	4.46E 00	1.021E 05
189	647.5	8.89E-07	5.99E-13	424.	36.3	16.47	9.94E 09	1.46E 02	2.87	17.76	614.	4.22E 00	1.021E 05
190	647.7	8.40E-07	5.64E-13	424.	36.2	16.54	9.40E 09	1.54E 02	2.87	17.84	616.	4.00E 00	1.021E 05
191	647.8	7.94E-07	5.31E-13	425.	36.0	16.61	8.88E 09	1.63E 02	2.87	17.93	617.	3.79E 00	1.021E 05
192	648.0	7.51E-07	5.00E-13	426.	35.9	16.68	8.40E 09	1.72E 02	2.88	18.02	618.	3.59E 00	1.021E 05
193	648.1	7.11E-07	4.71E-13	427.	35.7	16.75	7.95E 09	1.82E 02	2.88	18.10	620.	3.40E 00	1.021E 05
194	648.2	6.73E-07	4.44E-13	428.	35.6	16.82	7.52E 09	1.93E 02	2.88	18.19	621.	3.23E 00	1.021E 05
195	648.4	6.37E-07	4.18E-13	429.	35.4	16.89	7.12E 09	2.05E 02	2.88	18.28	623.	3.06E 00	1.021E 05
196	648.5	6.03E-07	3.94E-13	430.	35.3	16.96	6.74E 09	2.15E 02	2.88	18.37	624.	2.90E 00	1.021E 05
197	648.6	5.71E-07	3.72E-13	431.	35.1	17.03	6.38E 09	2.27E 02	2.88	18.46	626.	2.76E 00	1.021E 05
198	648.8	5.41E-07	3.51E-13	432.	34.9	17.10	6.04E 09	2.40E 02	2.88	18.55	627.	2.62E 00	1.021E 05
199	648.9	5.13E-07	3.31E-13	433.	34.8	17.17	5.72E 09	2.53E 02	2.88	18.64	628.	2.49E 00	1.021E 05
200	649.1	4.86E-07	3.12E-13	434.	34.6	17.25	5.42E 09	2.67E 02	2.88	18.73	630.	2.36E 00	1.021E 05

T A B L E 3

Model of the venus atmosphere based of the data of Venera 9 measurements construction parameters.

SURFACE PRESSURE = 90190.00 MB
 BASE OF EXOSPHERE = 4000.00(KM)
 RADIUS OF VENUS = 6090.00(KM)
 PERCENT OXYGEN = 0.0
 PERCENT NITROGEN = 3.000
 PERCENT CO = 0.0
 SURFACE TEMPERATURE = 758.00 K
 MOLECULAR WEIGHT = 43.801
 SURFACE GRAVITY = 887.600 CM/SEC/SEC
 PERCENT ARGON = 0.0
 PERCENT HELIUM = 0.0
 PERCENT NEON = 0.0
 PERCENT CO2 = 94.000
 PERCENT WATER = 1.500

TEMPERATURE AND MOLECULAR WEIGHT DISTRIBUTION

AT	5.00	GEOM KM	TEMPERATURE=	716.90	K	AND MOLECULAR	WEIGHT=	43.78000
AT	10.00	GEOM KM	TEMPERATURE=	676.40	K	AND MOLECULAR	WEIGHT=	43.78000
AT	15.00	GEOM KM	TEMPERATURE=	635.10	K	AND MOLECULAR	WEIGHT=	43.78000
AT	20.00	GEOM KM	TEMPERATURE=	593.20	K	AND MOLECULAR	WEIGHT=	43.78000
AT	25.00	GEOM KM	TEMPERATURE=	550.50	K	AND MOLECULAR	WEIGHT=	43.78000
AT	30.00	GEOM KM	TEMPERATURE=	507.00	K	AND MOLECULAR	WEIGHT=	43.78000
AT	35.00	GEOM KM	TEMPERATURE=	462.60	K	AND MOLECULAR	WEIGHT=	43.78000
AT	40.00	GEOM KM	TEMPERATURE=	436.50	K	AND MOLECULAR	WEIGHT=	43.78000
AT	44.00	GEOM KM	TEMPERATURE=	406.00	K	AND MOLECULAR	WEIGHT=	43.78000
AT	48.00	GEOM KM	TEMPERATURE=	378.00	K	AND MOLECULAR	WEIGHT=	43.78000
AT	52.00	GEOM KM	TEMPERATURE=	335.00	K	AND MOLECULAR	WEIGHT=	43.78000
AT	56.00	GEOM KM	TEMPERATURE=	301.00	K	AND MOLECULAR	WEIGHT=	43.78000
AT	60.00	GEOM KM	TEMPERATURE=	262.00	K	AND MOLECULAR	WEIGHT=	43.78000
AT	64.00	GEOM KM	TEMPERATURE=	234.00	K	AND MOLECULAR	WEIGHT=	43.78000
AT	68.00	GEOM KM	TEMPERATURE=	247.00	K	AND MOLECULAR	WEIGHT=	43.78000
AT	72.00	GEOM KM	TEMPERATURE=	241.00	K	AND MOLECULAR	WEIGHT=	43.78000
AT	76.00	GEOM KM	TEMPERATURE=	237.00	K	AND MOLECULAR	WEIGHT=	43.78000
AT	80.00	GEOM KM	TEMPERATURE=	211.00	K	AND MOLECULAR	WEIGHT=	43.78000
AT	84.00	GEOM KM	TEMPERATURE=	175.00	K	AND MOLECULAR	WEIGHT=	43.78000
AT	88.00	GEOM KM	TEMPERATURE=	150.00	K	AND MOLECULAR	WEIGHT=	43.78000
AT	90.00	GEOM KM	TEMPERATURE=	140.00	K	AND MOLECULAR	WEIGHT=	43.78000
AT	100.00	GEOM KM	TEMPERATURE=	171.40	K	AND MOLECULAR	WEIGHT=	43.78000
AT	110.00	GEOM KM	TEMPERATURE=	204.80	K	AND MOLECULAR	WEIGHT=	43.78000
AT	120.00	GEOM KM	TEMPERATURE=	262.80	K	AND MOLECULAR	WEIGHT=	43.78000
AT	130.00	GEOM KM	TEMPERATURE=	340.30	K	AND MOLECULAR	WEIGHT=	43.78000
AT	140.00	GEOM KM	TEMPERATURE=	426.80	K	AND MOLECULAR	WEIGHT=	43.78000
AT	150.00	GEOM KM	TEMPERATURE=	510.30	K	AND MOLECULAR	WEIGHT=	42.00000
AT	170.00	GEOM KM	TEMPERATURE=	625.10	K	AND MOLECULAR	WEIGHT=	39.39999
AT	180.00	GEOM KM	TEMPERATURE=	646.30	K	AND MOLECULAR	WEIGHT=	37.70000
AT	200.00	GEOP KM	TEMPERATURE=	650.00	K	AND MOLECULAR	WEIGHT=	33.59999

Table 3 (continued)
CALCULATED QUANTITIES

HEIGHT (KM)	TEMP (K)	PRESSURE (MB)	DENSITY (GM/CC)	SPEED OF SOUND (M/SEC)	MOLECULAR WEIGHT	DENS SCALE (KM)	NUMBER DENSITY (PER CC)	MEAN FREE PATH (M)	VIS- COSITY (E-5)	PRES SCALE (KM)	MEAN PARTICLE VELOCITY (M/SEC)	COLL FREQ (PER SEC)	COLUMNAR MASS
0	758.0	9.02E 04	6.27E-02	416.	43.8	19.67	8.62E 20	1.69E-09	3.15	16.21	605.	3.58E 11	0.0
1	749.8	8.46E 04	5.96E-02	414.	43.8	19.43	7.19E 20	1.78E-09	3.14	16.04	602.	3.38E 11	6.11E 03
2	741.6	7.96E 04	5.66E-02	411.	43.8	19.23	6.18E 20	1.87E-09	3.12	15.87	599.	3.19E 11	1.191E 04
3	733.3	7.47E 04	5.37E-02	409.	43.8	19.02	5.38E 20	1.98E-09	3.10	15.70	595.	3.01E 11	1.742E 04
4	725.1	7.01E 04	5.09E-02	407.	43.8	18.82	4.70E 20	2.08E-09	3.09	15.53	592.	2.84E 11	2.265E 04
5	716.9	6.57E 04	4.83E-02	404.	43.8	18.61	4.14E 20	2.20E-09	3.07	15.36	589.	2.68E 11	2.876E 04
6	708.8	6.15E 04	4.57E-02	402.	43.8	18.39	3.69E 20	2.32E-09	3.05	15.20	585.	2.53E 11	3.630E 04
7	700.7	5.76E 04	4.33E-02	400.	43.8	18.19	3.35E 20	2.45E-09	3.03	15.03	582.	2.38E 11	4.696E 04
8	692.6	5.39E 04	4.10E-02	398.	43.8	17.98	3.09E 20	2.59E-09	3.01	14.86	579.	2.24E 11	6.096E 04
9	684.5	5.03E 04	3.87E-02	395.	43.8	17.78	2.89E 20	2.74E-09	2.98	14.69	575.	2.10E 11	7.895E 04
10	676.4	4.70E 04	3.66E-02	393.	43.8	17.57	2.73E 20	2.90E-09	2.95	14.52	572.	1.98E 11	10.17E 04
11	668.1	4.39E 04	3.46E-02	391.	43.8	17.44	2.62E 20	3.07E-09	2.92	14.35	568.	1.85E 11	13.22E 04
12	659.9	4.09E 04	3.26E-02	389.	43.8	17.23	2.52E 20	3.25E-09	2.89	14.17	565.	1.74E 11	17.56E 04
13	651.6	3.81E 04	3.08E-02	386.	43.8	17.02	2.42E 20	3.44E-09	2.86	14.00	561.	1.63E 11	23.88E 04
14	643.4	3.55E 04	2.90E-02	384.	43.8	16.81	2.33E 20	3.65E-09	2.83	13.83	558.	1.53E 11	33.17E 04
15	635.1	3.30E 04	2.73E-02	382.	43.8	16.60	2.25E 20	3.88E-09	2.80	13.66	554.	1.43E 11	46.60E 04
16	626.7	3.06E 04	2.57E-02	379.	43.8	16.45	2.18E 20	4.12E-09	2.78	13.48	551.	1.34E 11	6.475E 04
17	618.3	2.84E 04	2.42E-02	377.	43.8	16.23	2.12E 20	4.38E-09	2.75	13.30	547.	1.25E 11	9.275E 04
18	610.0	2.63E 04	2.27E-02	375.	43.8	16.02	2.07E 20	4.66E-09	2.72	13.13	543.	1.17E 11	1.290E 04
19	601.6	2.44E 04	2.14E-02	372.	43.8	15.80	2.02E 20	4.96E-09	2.69	12.95	539.	1.09E 11	1.7430E 04
20	593.2	2.26E 04	2.00E-02	370.	43.8	15.59	1.97E 20	5.29E-09	2.66	12.78	536.	1.01E 11	2.363E 04
21	584.7	2.09E 04	1.88E-02	367.	43.8	15.44	1.92E 20	5.64E-09	2.63	12.60	532.	9.43E 10	3.231E 04
22	576.1	1.93E 04	1.76E-02	365.	43.8	15.22	1.87E 20	6.02E-09	2.60	12.42	528.	8.77E 10	4.401E 04
23	567.6	1.78E 04	1.65E-02	362.	43.8	15.00	1.82E 20	6.43E-09	2.57	12.24	524.	8.15E 10	5.983E 04
24	559.0	1.64E 04	1.54E-02	360.	43.8	14.78	1.77E 20	6.88E-09	2.55	12.06	520.	7.56E 10	8.042E 04
25	550.5	1.50E 04	1.44E-02	357.	43.8	14.56	1.72E 20	7.36E-09	2.52	11.88	516.	7.01E 10	10.691E 04
26	541.8	1.38E 04	1.34E-02	355.	43.8	14.40	1.68E 20	7.89E-09	2.49	11.69	512.	6.49E 10	14.630E 04
27	533.1	1.27E 04	1.25E-02	352.	43.8	14.17	1.62E 20	8.46E-09	2.46	11.51	508.	6.00E 10	19.870E 04
28	524.4	1.16E 04	1.17E-02	349.	43.8	13.94	1.60E 20	9.08E-09	2.43	11.32	504.	5.54E 10	27.881E 04
29	515.7	1.06E 04	1.09E-02	346.	43.8	13.72	1.49E 20	9.77E-09	2.40	11.14	499.	5.11E 10	39.993E 04
30	507.0	9.71E 03	1.01E-02	344.	43.8	13.49	1.39E 20	1.05E-08	2.37	10.96	495.	4.71E 10	57.098E 04
31	498.1	8.85E 03	9.36E-03	341.	43.8	13.34	1.29E 20	1.13E-08	2.34	10.77	491.	4.33E 10	8.195E 04
32	489.2	8.06E 03	8.68E-03	338.	43.8	13.11	1.19E 20	1.22E-08	2.30	10.58	486.	3.98E 10	12.205E 04
33	480.2	7.33E 03	8.04E-03	335.	43.8	12.87	1.11E 20	1.32E-08	2.26	10.39	482.	3.65E 10	17.369E 04
34	471.3	6.65E 03	7.43E-03	332.	43.8	12.64	1.02E 20	1.43E-08	2.23	10.20	477.	3.35E 10	24.466E 04
35	462.4	6.02E 03	6.86E-03	329.	43.8	12.40	9.44E 19	1.55E-08	2.19	10.01	473.	3.06E 10	35.18E 04
36	452.7	5.45E 03	6.27E-03	328.	43.8	11.15	8.63E 19	1.69E-08	2.17	9.91	470.	2.78E 10	50.583E 04
37	442.0	4.92E 03	5.73E-03	326.	43.8	11.03	7.89E 19	1.85E-08	2.15	9.79	468.	2.53E 10	70.643E 04
38	446.9	4.44E 03	5.23E-03	324.	43.8	10.91	7.20E 19	2.03E-08	2.13	9.68	465.	2.30E 10	9.698E 04
39	441.7	4.00E 03	4.77E-03	323.	43.8	10.78	6.57E 19	2.22E-08	2.10	9.57	462.	2.08E 10	13.474E 04
40	436.5	3.60E 03	4.35E-03	321.	43.8	10.66	5.98E 19	2.44E-08	2.08	9.46	459.	1.88E 10	19.793E 04
41	428.9	3.24E 03	3.98E-03	318.	43.8	11.14	5.47E 19	2.66E-08	2.05	9.30	455.	1.71E 10	28.835E 04
42	421.2	2.91E 03	3.63E-03	316.	43.8	10.95	5.00E 19	2.92E-08	2.02	9.14	451.	1.55E 10	41.873E 04
43	413.6	2.60E 03	3.31E-03	313.	43.8	10.76	4.56E 19	3.20E-08	1.99	8.98	447.	1.40E 10	60.998E 04
44	406.0	2.35E 03	3.02E-03	310.	43.8	10.56	4.15E 19	3.51E-08	1.96	8.81	443.	1.26E 10	87.930E 04
45	399.0	2.07E 03	2.74E-03	308.	43.8	10.22	3.77E 19	3.87E-08	1.93	8.66	439.	1.13E 10	124.968E 04

Table 3 (continued)

46	392.0	1.85E 03	2.48E-03	305.	43.8	10.04	3.47E 19	4.27E-08	1.90	8.52	435.	1.02E 10	9.994E 04
47	385.0	1.64E 03	2.24E-03	303.	43.8	9.87	3.09E 19	4.72E-08	1.86	8.37	431.	9.13E 09	1.002E 05
48	378.0	1.45E 03	2.03E-03	300.	43.8	9.69	2.79E 19	5.23E-08	1.83	8.22	428.	8.17E 09	1.004E 05
49	367.2	1.28E 03	1.84E-03	297.	43.8	10.42	2.53E 19	5.75E-08	1.78	7.99	421.	7.33E 09	1.006E 05
50	356.5	1.13E 03	1.67E-03	293.	43.8	10.12	2.30E 19	6.34E-08	1.73	7.75	415.	6.55E 09	1.008E 05
51	345.7	9.93E 02	1.51E-03	289.	43.8	9.82	2.08E 19	7.01E-08	1.68	7.52	409.	5.82E 09	1.009E 05
52	335.0	8.67E 02	1.36E-03	284.	43.8	9.52	1.88E 19	7.77E-08	1.63	7.29	403.	5.18E 09	1.011E 05
53	326.5	7.55E 02	1.22E-03	281.	43.8	8.72	1.67E 19	8.71E-08	1.59	7.11	397.	4.56E 09	1.012E 05
54	318.0	6.55E 02	1.08E-03	278.	43.8	8.50	1.49E 19	9.78E-08	1.55	6.93	392.	4.01E 09	1.013E 05
55	309.5	5.66E 02	9.62E-04	274.	43.8	8.28	1.32E 19	1.10E-07	1.52	6.74	387.	3.51E 09	1.014E 05
56	301.0	4.87E 02	8.51E-04	271.	43.8	8.05	1.17E 19	1.23E-07	1.48	6.56	382.	3.06E 09	1.015E 05
57	291.2	4.17E 02	7.53E-04	267.	43.8	8.06	1.04E 19	1.41E-07	1.43	6.35	375.	2.67E 09	1.016E 05
58	281.5	3.55E 02	6.64E-04	263.	43.8	7.80	9.14E 18	1.60E-07	1.38	6.14	369.	2.31E 09	1.016E 05
59	271.7	3.01E 02	5.83E-04	259.	43.8	7.53	8.02E 18	1.82E-07	1.33	5.93	363.	1.99E 09	1.017E 05
60	262.0	2.53E 02	5.09E-04	255.	43.8	7.26	7.00E 18	2.08E-07	1.29	5.72	356.	1.71E 09	1.018E 05
61	255.0	2.12E 02	4.38E-04	252.	43.8	6.57	6.03E 18	2.45E-07	1.26	5.57	351.	1.42E 09	1.018E 05
62	248.0	1.77E 02	3.76E-04	248.	43.8	6.39	5.17E 18	2.82E-07	1.22	5.42	346.	1.23E 09	1.019E 05
63	241.0	1.47E 02	3.20E-04	245.	43.8	6.21	4.41E 18	3.31E-07	1.19	5.26	341.	1.03E 09	1.019E 05
64	234.0	1.21E 02	2.72E-04	242.	43.8	6.04	3.74E 18	3.89E-07	1.16	5.11	336.	8.64E 08	1.019E 05
65	237.3	9.96E 01	2.21E-04	244.	43.8	4.84	3.04E 18	4.79E-07	1.18	5.19	339.	7.07E 08	1.019E 05
66	240.5	8.22E 01	1.80E-04	246.	43.8	4.91	2.48E 18	5.89E-07	1.19	5.26	341.	5.79E 08	1.020E 05
67	243.8	6.81E 01	1.47E-04	247.	43.8	4.98	2.02E 18	7.21E-07	1.20	5.33	343.	4.77E 08	1.020E 05
68	247.0	5.65E 01	1.20E-04	248.	43.8	5.05	1.66E 18	8.80E-07	1.22	5.40	346.	3.93E 08	1.020E 05
69	245.5	4.69E 01	1.01E-04	247.	43.8	5.56	1.39E 18	1.05E-06	1.21	5.37	345.	3.27E 08	1.020E 05
70	244.0	3.90E 01	8.41E-05	247.	43.8	5.52	1.16E 18	1.25E-06	1.21	5.34	344.	2.72E 08	1.020E 05
71	242.5	3.23E 01	7.01E-05	246.	43.8	5.49	9.64E 17	1.51E-06	1.20	5.31	342.	2.27E 08	1.020E 05
72	241.0	2.87E 01	5.84E-05	245.	43.8	5.46	8.03E 17	1.81E-06	1.19	5.28	341.	1.88E 08	1.020E 05
73	240.0	2.27E 01	4.85E-05	245.	43.8	5.38	6.67E 17	2.18E-06	1.19	5.26	341.	1.56E 08	1.020E 05
74	239.0	1.83E 01	4.03E-05	244.	43.8	5.36	5.54E 17	2.63E-06	1.18	5.24	340.	1.29E 08	1.020E 05
75	238.0	1.51E 01	3.34E-05	244.	43.8	5.34	4.59E 17	3.17E-06	1.18	5.22	339.	1.07E 08	1.020E 05
76	237.0	1.25E 01	2.77E-05	243.	43.8	5.32	3.81E 17	3.83E-06	1.17	5.20	339.	8.84E 07	1.020E 05
77	230.5	1.03E 01	2.34E-05	240.	43.8	5.90	3.22E 17	4.53E-06	1.15	5.06	338.	7.38E 07	1.020E 05
78	224.0	8.39E 00	1.97E-05	237.	43.8	5.74	2.71E 17	5.37E-06	1.12	4.92	329.	6.12E 07	1.020E 05
79	217.5	6.82E 00	1.65E-05	234.	43.8	5.57	2.27E 17	6.41E-06	1.09	4.78	324.	5.06E 07	1.020E 05
80	211.0	5.52E 00	1.38E-05	231.	43.8	5.43	1.89E 17	7.70E-06	1.06	4.63	319.	4.15E 07	1.020E 05
81	202.0	4.43E 00	1.15E-05	227.	43.8	5.51	1.59E 17	9.19E-06	1.03	4.44	313.	3.40E 07	1.020E 05
82	193.0	3.52E 00	9.59E-06	222.	43.8	5.29	1.32E 17	1.11E-05	0.97	4.24	306.	2.76E 07	1.021E 05
83	184.0	2.76E 00	7.90E-06	217.	43.8	5.04	1.09E 17	1.34E-05	0.90	4.05	291.	2.22E 07	1.021E 05
84	175.0	2.14E 00	6.45E-06	212.	43.8	4.80	8.87E 16	1.64E-05	0.85	3.85	285.	1.77E 07	1.021E 05
85	168.7	1.65E 00	5.13E-06	208.	43.8	4.30	7.06E 16	2.06E-05	0.81	3.71	286.	1.38E 07	1.021E 05
86	162.5	1.25E 00	4.05E-06	205.	43.8	4.15	5.75E 16	2.62E-05	0.77	3.58	280.	1.07E 07	1.021E 05
87	156.2	9.40E-01	3.17E-06	201.	43.8	3.99	4.36E 16	3.34E-05	0.74	3.44	275.	8.22E 06	1.021E 05
88	150.0	6.99E-01	2.45E-06	197.	43.8	3.83	3.37E 16	4.32E-05	0.71	3.30	269.	6.23E 06	1.021E 05
89	145.0	5.14E-01	1.87E-06	194.	43.8	3.59	2.57E 16	5.68E-05	0.68	3.19	265.	4.66E 06	1.021E 05
90	140.0	3.74E-01	1.41E-06	191.	43.8	3.47	1.93E 16	7.54E-05	0.66	3.09	260.	3.45E 06	1.021E 05
91	143.1	2.71E-01	9.97E-07	193.	43.8	2.95	1.37E 16	1.04E-04	0.67	3.16	263.	2.46E 06	1.021E 05
92	146.3	1.98E-01	7.13E-07	195.	43.8	3.02	9.81E 15	1.49E-04	0.69	3.23	266.	1.79E 06	1.021E 05
93	149.4	1.46E-01	5.14E-07	197.	43.8	3.08	7.07E 15	2.06E-04	0.70	3.30	269.	1.30E 06	1.021E 05
94	152.6	1.08E-01	3.73E-07	199.	43.8	3.15	5.13E 15	2.84E-04	0.72	3.37	272.	9.50E 05	1.021E 05
95	155.7	8.05E-02	2.72E-07	201.	43.8	3.21	3.75E 15	3.89E-04	0.74	3.44	274.	7.05E 05	1.021E 05
96	158.9	6.04E-02	2.00E-07	202.	43.8	3.28	2.75E 15	5.30E-04	0.75	3.51	277.	5.23E 05	1.021E 05
97	162.0	4.55E-02	1.48E-07	204.	43.8	3.35	2.04E 15	7.16E-04	0.77	3.58	280.	3.91E 05	1.021E 05

Table 3 (continued)

98	165.1	3.45E-02	1.10E-07	20.6	43.8	3.41	1.51E 15	9.53E-04	0.79	3.65	283.	2.93E 05	1.021E 05
99	168.3	2.63E-02	8.23E-08	208.	43.8	3.48	1.73E 15	1.29E-03	0.81	3.72	285.	2.22E 05	1.021E 05
100	171.4	2.02E-02	6.19E-08	210.	43.8	3.54	8.52E 14	1.71E-03	0.82	3.79	288.	1.68E 05	1.021E 05
101	174.7	1.55E-02	4.68E-08	212.	43.8	3.60	6.43E 14	2.27E-03	0.84	3.86	291.	1.28E 05	1.021E 05
102	178.1	1.20E-02	3.55E-08	214.	43.8	3.67	4.89E 14	2.98E-03	0.87	3.94	293.	9.83E 04	1.021E 05
103	181.4	9.34E-03	2.71E-08	216.	43.8	3.74	3.73E 14	3.91E-03	0.89	4.02	296.	7.58E 04	1.021E 05
104	184.8	7.30E-03	2.08E-08	217.	43.8	3.81	2.86E 14	5.10E-03	0.91	4.09	299.	5.87E 04	1.021E 05
105	188.1	5.73E-03	1.60E-08	219.	43.8	3.88	2.21E 14	6.61E-03	0.93	4.17	302.	4.56E 04	1.021E 05
106	191.5	4.52E-03	1.24E-08	221.	43.8	3.95	1.71E 14	8.53E-03	0.95	4.24	304.	3.57E 04	1.021E 05
107	194.8	3.57E-03	9.66E-09	223.	43.8	4.02	1.33E 14	1.10E-02	0.98	4.32	307.	2.80E 04	1.021E 05
108	198.1	2.84E-03	7.55E-09	225.	43.8	4.09	1.04E 14	1.40E-02	1.00	4.39	310.	2.21E 04	1.021E 05
109	201.5	2.27E-03	5.97E-09	226.	43.8	4.16	8.15E 13	1.79E-02	1.02	4.47	312.	1.75E 04	1.021E 05
110	204.8	1.82E-03	4.67E-09	228.	43.8	4.23	6.42E 13	2.27E-02	1.04	4.54	315.	1.39E 04	1.021E 05
111	210.6	1.46E-03	3.65E-09	231.	43.8	4.31	5.03E 13	2.90E-02	1.06	4.67	319.	1.10E 04	1.021E 05
112	216.4	1.18E-03	2.88E-09	234.	43.8	4.42	3.96E 13	3.68E-02	1.09	4.80	322.	8.79E 03	1.021E 05
113	222.2	9.64E-04	2.28E-09	237.	43.8	4.53	3.14E 13	4.64E-02	1.11	4.93	325.	7.06E 03	1.021E 05
114	228.0	7.89E-04	1.82E-09	239.	43.8	4.69	2.51E 13	5.82E-02	1.14	5.06	332.	5.71E 03	1.021E 05
115	233.8	6.49E-04	1.46E-09	242.	43.8	4.86	2.01E 13	7.25E-02	1.16	5.19	336.	4.64E 03	1.021E 05
116	239.6	5.37E-04	1.18E-09	245.	43.8	4.72	1.62E 13	8.98E-02	1.19	5.33	340.	3.79E 03	1.021E 05
117	245.4	4.46E-04	9.57E-10	247.	43.8	4.83	1.32E 13	1.11E-01	1.21	5.46	345.	3.11E 03	1.021E 05
118	251.2	3.72E-04	7.80E-10	250.	43.8	4.95	1.07E 13	1.36E-01	1.24	5.59	349.	2.56E 03	1.021E 05
119	257.0	3.12E-04	6.39E-10	252.	43.8	5.06	8.78E 12	1.66E-01	1.27	5.72	353.	2.12E 03	1.021E 05
120	262.8	2.62E-04	5.25E-10	255.	43.8	5.18	7.23E 12	2.02E-01	1.29	5.85	356.	1.77E 03	1.021E 05
121	270.6	2.22E-04	4.31E-10	258.	43.8	5.14	5.93E 12	2.46E-01	1.33	6.02	362.	1.47E 03	1.021E 05
122	278.3	1.88E-04	3.56E-10	262.	43.8	5.28	4.90E 12	2.98E-01	1.37	6.20	367.	1.23E 03	1.021E 05
123	286.1	1.60E-04	2.95E-10	265.	43.8	5.43	4.06E 12	3.59E-01	1.40	6.37	372.	1.04E 03	1.021E 05
124	293.8	1.37E-04	2.46E-10	268.	43.8	5.58	3.39E 12	4.30E-01	1.44	6.55	377.	8.76E 02	1.021E 05
125	301.6	1.18E-04	2.06E-10	271.	43.8	5.73	2.84E 12	5.14E-01	1.48	6.72	382.	7.44E 02	1.021E 05
126	309.3	1.02E-04	1.74E-10	274.	43.8	5.88	2.39E 12	6.10E-01	1.52	6.90	387.	6.34E 02	1.021E 05
127	317.1	8.84E-05	1.47E-10	277.	43.8	6.03	2.02E 12	7.22E-01	1.55	7.07	392.	5.43E 02	1.021E 05
128	324.8	7.69E-05	1.25E-10	281.	43.8	6.18	1.71E 12	8.50E-01	1.58	7.25	396.	4.66E 02	1.021E 05
129	332.6	6.71E-05	1.06E-10	284.	43.8	6.33	1.44E 12	9.98E-01	1.62	7.42	401.	4.02E 02	1.021E 05
130	340.3	5.87E-05	9.09E-11	286.	43.8	6.48	1.25E 12	1.17E 00	1.65	7.60	406.	3.48E 02	1.021E 05
131	349.0	5.16E-05	7.78E-11	290.	43.8	6.53	1.07E 12	1.36E 00	1.69	7.79	411.	3.02E 02	1.021E 05
132	357.6	4.54E-05	6.69E-11	293.	43.8	6.69	9.20E 11	1.58E 00	1.73	7.99	416.	2.63E 02	1.021E 05
133	366.3	4.02E-05	5.77E-11	296.	43.8	6.86	7.94E 11	1.84E 00	1.77	8.19	421.	2.29E 02	1.021E 05
134	374.9	3.56E-05	5.00E-11	299.	43.8	7.02	6.88E 11	2.24E 00	1.82	8.38	426.	2.01E 02	1.021E 05
135	383.6	3.16E-05	4.34E-11	302.	43.8	7.19	5.97E 11	2.64E 00	1.86	8.58	431.	1.76E 02	1.021E 05
136	392.2	2.82E-05	3.78E-11	306.	43.8	7.35	5.20E 11	3.00E 00	1.90	8.77	436.	1.55E 02	1.021E 05
137	400.9	2.52E-05	3.31E-11	309.	43.8	7.52	4.55E 11	3.20E 00	1.94	8.97	440.	1.37E 02	1.021E 05
138	409.5	2.26E-05	2.90E-11	312.	43.8	7.68	3.99E 11	3.66E 00	1.98	9.17	445.	1.22E 02	1.021E 05
139	418.2	2.02E-05	2.55E-11	315.	43.8	7.85	3.51E 11	4.16E 00	2.01	9.36	450.	1.08E 02	1.021E 05
140	426.8	1.82E-05	2.25E-11	318.	43.8	8.01	3.09E 11	4.72E 00	2.05	9.56	454.	9.63E 01	1.021E 05
141	435.2	1.64E-05	1.98E-11	321.	43.6	7.98	2.73E 11	5.33E 00	2.08	9.79	460.	8.62E 01	1.021E 05
142	443.5	1.48E-05	1.75E-11	325.	43.4	8.15	2.42E 11	6.01E 00	2.11	10.02	465.	7.73E 01	1.021E 05
143	451.9	1.35E-05	1.55E-11	328.	43.4	8.33	2.16E 11	6.76E 00	2.15	10.26	470.	6.96E 01	1.021E 05
144	460.2	1.22E-05	1.37E-11	331.	43.1	8.51	1.92E 11	7.58E 00	2.18	10.49	476.	6.27E 01	1.021E 05
145	468.6	1.11E-05	1.22E-11	335.	42.9	8.69	1.72E 11	8.48E 00	2.21	10.73	481.	5.67E 01	1.021E 05
146	476.9	1.01E-05	1.09E-11	338.	42.7	8.87	1.54E 11	9.47E 00	2.25	10.97	486.	5.14E 01	1.021E 05
147	485.3	9.26E-06	9.77E-12	342.	42.5	9.05	1.38E 11	1.05E 01	2.28	11.21	491.	4.66E 01	1.021E 05
148	493.6	8.48E-06	8.75E-12	345.	42.4	9.23	1.24E 11	1.17E 01	2.32	11.46	497.	4.24E 01	1.021E 05
149	502.0	7.78E-06	7.86E-12	349.	42.2	9.42	1.12E 11	1.30E 01	2.35	11.70	502.	3.87E 01	1.021E 05

Table 3 (continued)

150	510.3	7.15E-06	7.08E-12	352.	42.0	9.60	1.01E 11	1.44E 01	2.38	11.95	507.	3.53E 01	1.021E 05
151	516.1	6.58E-06	6.42E-12	354.	41.9	10.34	9.24E 10	1.58E 01	2.40	12.13	511.	3.24E 01	1.021E 05
152	521.8	6.06E-06	5.83E-12	357.	41.7	10.49	8.42E 10	1.73E 01	2.42	12.31	514.	2.97E 01	1.021E 05
153	527.6	5.59E-06	5.31E-12	359.	41.6	10.63	7.68E 10	1.90E 01	2.44	12.49	518.	2.73E 01	1.021E 05
154	533.3	5.17E-06	4.83E-12	362.	41.5	10.77	7.02E 10	2.08E 01	2.46	12.66	522.	2.51E 01	1.021E 05
155	539.1	4.78E-06	4.41E-12	364.	41.3	10.91	6.42E 10	2.27E 01	2.48	12.85	525.	2.31E 01	1.021E 05
156	544.8	4.42E-06	4.02E-12	366.	41.2	11.06	5.88E 10	2.48E 01	2.50	13.03	529.	2.13E 01	1.021E 05
157	550.6	4.10E-06	3.68E-12	369.	41.1	11.20	5.39E 10	2.71E 01	2.52	13.21	533.	1.97E 01	1.021E 05
158	556.3	3.80E-06	3.36E-12	371.	41.0	11.35	4.95E 10	2.95E 01	2.54	13.40	536.	1.82E 01	1.021E 05
159	562.1	3.53E-06	3.08E-12	373.	40.8	11.50	4.55E 10	3.21E 01	2.56	13.58	540.	1.68E 01	1.021E 05
160	567.8	3.28E-06	2.83E-12	376.	40.7	11.64	4.18E 10	3.49E 01	2.57	13.77	543.	1.56E 01	1.021E 05
161	573.5	3.05E-06	2.60E-12	378.	40.6	11.79	3.85E 10	3.78E 01	2.59	13.96	547.	1.45E 01	1.021E 05
162	579.3	2.84E-06	2.39E-12	381.	40.4	11.94	3.55E 10	4.10E 01	2.61	14.15	551.	1.34E 01	1.021E 05
163	585.0	2.65E-06	2.20E-12	383.	40.3	12.09	3.28E 10	4.45E 01	2.63	14.34	554.	1.25E 01	1.021E 05
164	590.7	2.47E-06	2.02E-12	385.	40.2	12.24	3.03E 10	4.81E 01	2.65	14.53	558.	1.16E 01	1.021E 05
165	596.5	2.31E-06	1.86E-12	388.	40.0	12.39	2.80E 10	5.20E 01	2.67	14.72	562.	1.08E 01	1.021E 05
166	602.2	2.16E-06	1.72E-12	390.	39.9	12.54	2.60E 10	5.62E 01	2.69	14.92	565.	1.01E 01	1.021E 05
167	607.9	2.02E-06	1.59E-12	392.	39.8	12.69	2.41E 10	6.06E 01	2.71	15.11	569.	9.38E 00	1.021E 05
168	613.7	1.89E-06	1.47E-12	395.	39.7	12.84	2.23E 10	6.53E 01	2.73	15.31	572.	8.76E 00	1.021E 05
169	619.4	1.77E-06	1.36E-12	397.	39.5	12.99	2.07E 10	7.04E 01	2.75	15.51	576.	8.18E 00	1.021E 05
170	625.1	1.66E-06	1.26E-12	399.	39.4	13.15	1.93E 10	7.57E 01	2.77	15.71	580.	7.65E 00	1.021E 05
171	627.2	1.56E-06	1.17E-12	401.	39.2	14.12	1.80E 10	8.10E 01	2.78	15.84	582.	7.19E 00	1.021E 05
172	629.3	1.46E-06	1.09E-12	403.	39.1	14.22	1.69E 10	8.65E 01	2.79	15.96	584.	6.75E 00	1.021E 05
173	631.5	1.38E-06	1.02E-12	404.	38.9	14.32	1.58E 10	9.24E 01	2.79	16.09	586.	6.35E 00	1.021E 05
174	633.6	1.29E-06	9.50E-13	406.	38.7	14.42	1.48E 10	9.86E 01	2.80	16.22	589.	5.97E 00	1.021E 05
175	635.7	1.22E-06	8.87E-13	407.	38.5	14.52	1.39E 10	1.05E 02	2.81	16.35	591.	5.62E 00	1.021E 05
176	637.8	1.14E-06	8.28E-13	409.	38.4	14.63	1.30E 10	1.12E 02	2.81	16.49	593.	5.29E 00	1.021E 05
177	639.9	1.08E-06	7.74E-13	410.	38.2	14.73	1.22E 10	1.20E 02	2.82	16.62	595.	4.98E 00	1.021E 05
178	642.1	1.01E-06	7.23E-13	412.	38.0	14.83	1.14E 10	1.27E 02	2.83	16.75	598.	4.69E 00	1.021E 05
179	644.2	9.56E-07	6.76E-13	413.	37.9	14.94	1.07E 10	1.36E 02	2.84	16.89	600.	4.42E 00	1.021E 05
180	646.3	9.01E-07	6.32E-13	415.	37.7	15.04	1.01E 10	1.44E 02	2.84	17.03	602.	4.17E 00	1.021E 05
181	648.4	8.50E-07	5.94E-13	416.	37.5	15.94	9.52E 09	1.53E 02	2.84	17.11	604.	3.94E 00	1.021E 05
182	646.6	8.02E-07	5.58E-13	417.	37.4	16.00	8.98E 09	1.62E 02	2.84	17.19	605.	3.73E 00	1.021E 05
183	646.7	7.57E-07	5.24E-13	418.	37.2	16.07	8.47E 09	1.72E 02	2.85	17.27	606.	3.52E 00	1.021E 05
184	646.9	7.14E-07	4.92E-13	418.	37.1	16.14	8.00E 09	1.82E 02	2.85	17.35	608.	3.32E 00	1.021E 05
185	647.0	6.74E-07	4.63E-13	419.	36.9	16.20	7.55E 09	1.93E 02	2.85	17.43	609.	3.15E 00	1.021E 05
186	647.1	6.37E-07	4.35E-13	420.	36.8	16.27	7.13E 09	2.05E 02	2.85	17.51	610.	2.98E 00	1.021E 05
187	647.3	6.01E-07	4.09E-13	421.	36.6	16.34	6.73E 09	2.17E 02	2.85	17.59	612.	2.82E 00	1.021E 05
188	647.4	5.68E-07	3.85E-13	422.	36.5	16.40	6.36E 09	2.29E 02	2.85	17.67	613.	2.67E 00	1.021E 05
189	647.5	5.37E-07	3.62E-13	423.	36.3	16.47	6.01E 09	2.43E 02	2.85	17.76	614.	2.53E 00	1.021E 05
190	647.7	5.08E-07	3.41E-13	424.	36.2	16.54	5.68E 09	2.57E 02	2.85	17.84	616.	2.40E 00	1.021E 05
191	647.8	4.80E-07	3.21E-13	425.	36.0	16.61	5.37E 09	2.72E 02	2.85	17.93	617.	2.27E 00	1.021E 05
192	648.0	4.54E-07	3.02E-13	426.	35.9	16.68	5.08E 09	2.87E 02	2.85	18.02	618.	2.15E 00	1.021E 05
193	648.1	4.30E-07	2.85E-13	427.	35.7	16.75	4.80E 09	3.04E 02	2.85	18.10	620.	2.04E 00	1.021E 05
194	648.2	4.07E-07	2.68E-13	428.	35.6	16.82	4.54E 09	3.21E 02	2.85	18.19	621.	1.94E 00	1.021E 05
195	648.4	3.85E-07	2.53E-13	429.	35.4	16.89	4.30E 09	3.39E 02	2.85	18.28	623.	1.84E 00	1.021E 05
196	648.5	3.64E-07	2.38E-13	430.	35.3	16.96	4.07E 09	3.58E 02	2.85	18.37	624.	1.74E 00	1.021E 05
197	648.6	3.44E-07	2.25E-13	431.	35.1	17.03	3.86E 09	3.78E 02	2.85	18.46	626.	1.65E 00	1.021E 05
198	648.8	3.27E-07	2.12E-13	432.	34.9	17.10	3.65E 09	3.99E 02	2.85	18.55	627.	1.57E 00	1.021E 05
199	648.9	3.10E-07	2.00E-13	433.	34.8	17.17	3.46E 09	4.21E 02	2.85	18.64	628.	1.49E 00	1.021E 05
200	649.1	2.94E-07	1.89E-13	434.	34.6	17.25	3.28E 09	4.45E 02	2.85	18.73	630.	1.42E 00	1.021E 05

T A B L E 4

Model of the venus atmosphere based of the data of Venera 9 measurement construction parameters.

SURFACE PRESSURE = 90190.00 MB SURFACE TEMPERATURE = 759.70 K SURFACE DENSITY = 0.637E-01 G/CC
 BASE OF EXOSPHERE = 4000.00 (KM) MOLECULAR WEIGHT = 44.501 SURFACE GRAVITY = 887.600 CM/SFC./SEC
 RADIUS OF VENUS = 6050.00 (KM) PERCENT CO₂ = 94.000
 PERCENT OXYGEN = 0.0 PERCENT ARGON = 0.0 PERCENT NEON = 0.0
 PERCENT NITROGEN = 3.000 PERCENT HELIUM = 0.0 PERCENT WATER = 0.500
 PERCENT CO = 0.0 PERCENT SODIUM = 0.0

TEMPERATURE AND MOLECULAR WEIGHT DISTRIBUTION

AT	5.00	GEOM KM	716.90	K	AND MOLECULAR WEIGHT=	44.48999
AT	10.00	GEOM KM	676.40	K	AND MOLECULAR WEIGHT=	44.48999
AT	15.00	GEOM KM	635.20	K	AND MOLECULAR WEIGHT=	44.48999
AT	20.00	GEOM KM	593.20	K	AND MOLECULAR WEIGHT=	44.48999
AT	25.00	GEOM KM	550.50	K	AND MOLECULAR WEIGHT=	44.48999
AT	30.00	GEOM KM	507.00	K	AND MOLECULAR WEIGHT=	44.48999
AT	35.00	GEOM KM	462.40	K	AND MOLECULAR WEIGHT=	44.48999
AT	40.00	GEOM KM	436.50	K	AND MOLECULAR WEIGHT=	44.48999
AT	44.00	GEOM KM	406.00	K	AND MOLECULAR WEIGHT=	44.48999
AT	48.00	GEOM KM	378.00	K	AND MOLECULAR WEIGHT=	44.48999
AT	52.00	GEOM KM	343.00	K	AND MOLECULAR WEIGHT=	44.48999
AT	56.00	GEOM KM	303.00	K	AND MOLECULAR WEIGHT=	44.48999
AT	60.00	GEOM KM	269.00	K	AND MOLECULAR WEIGHT=	44.48999
AT	64.00	GEOM KM	254.00	K	AND MOLECULAR WEIGHT=	44.48999
AT	68.00	GEOM KM	238.00	K	AND MOLECULAR WEIGHT=	44.48999
AT	72.00	GEOM KM	222.00	K	AND MOLECULAR WEIGHT=	44.48999
AT	76.00	GEOM KM	207.00	K	AND MOLECULAR WEIGHT=	44.48999
AT	80.00	GEOM KM	197.00	K	AND MOLECULAR WEIGHT=	44.48999
AT	84.00	GEOM KM	184.00	K	AND MOLECULAR WEIGHT=	44.48999
AT	88.00	GEOM KM	171.00	K	AND MOLECULAR WEIGHT=	44.48999
AT	90.00	GEOM KM	175.00	K	AND MOLECULAR WEIGHT=	44.48999
AT	100.00	GEOM KM	171.40	K	AND MOLECULAR WEIGHT=	44.48999
AT	110.00	GEOM KM	204.80	K	AND MOLECULAR WEIGHT=	44.48999
AT	120.00	GEOM KM	262.80	K	AND MOLECULAR WEIGHT=	44.48999
AT	130.00	GEOM KM	340.30	K	AND MOLECULAR WEIGHT=	44.48999
AT	140.00	GEOM KM	428.80	K	AND MOLECULAR WEIGHT=	44.48999
AT	150.00	GEOM KM	510.30	K	AND MOLECULAR WEIGHT=	47.06000
AT	170.00	GEOM KM	625.10	K	AND MOLECULAR WEIGHT=	39.39999
AT	180.00	GEOM KM	646.30	K	AND MOLECULAR WEIGHT=	37.70000
AT	200.00	GEOP KM	650.00	K	AND MOLECULAR WEIGHT=	33.59999

Table 4 (continued)
CALCULATED QUANTITIES

HEIGHT (KM)	TEMP (K)	PRESSURE (MB)	DENSITY (GM/CC)	SPEED OF SOUND (M/SEC)	MOLECULAR WEIGHT	DEVS SCALEF (KM)	NUMBER DENSITY (PER CC)	MEAN FREE PATH (M)	VIS- SISITY (L+5)	WIS- SISITY (KM)	MEAN PARTICLE COLL VELOCITY (M/SEC)	COLUMNAR MASS (PER SFC)
0	758.0	9.402E 04	5.37E-02	412.	44.5	19.30	8.62E 20	1.68E-09	3.14	15.96	601.	0.
1	749.8	8.47E 04	6.04E-02	410.	44.5	19.20	8.18E 20	1.77E-09	3.11	15.79	597.	6.205E 03
2	741.6	7.95E 04	5.73E-02	408.	44.5	18.88	7.76E 20	1.87E-09	3.11	15.62	594.	1.209E 04
3	733.3	7.45E 04	5.44E-02	405.	44.5	18.57	7.36E 20	1.97E-09	3.09	15.45	591.	3.00E 11
4	725.1	6.98E 04	5.15E-02	403.	44.5	18.27	6.97E 20	2.08E-09	3.07	15.29	587.	1.769E 04
5	716.9	6.54E 04	4.88E-02	401.	44.5	18.00	6.60E 20	2.20E-09	3.06	15.12	584.	2.798E 04
6	708.8	6.12E 04	4.62E-02	398.	44.5	18.04	6.25E 20	2.32E-09	3.04	14.95	581.	3.274E 04
7	700.7	5.72E 04	4.37E-02	396.	44.5	17.84	5.91E 20	2.45E-09	3.02	14.79	577.	3.722E 04
8	692.6	5.34E 04	4.13E-02	394.	44.5	17.54	5.59E 20	2.60E-09	2.99	14.62	574.	4.147E 04
9	684.5	4.99E 04	3.90E-02	392.	44.5	17.44	5.28E 20	2.75E-09	2.96	14.45	571.	4.548E 04
10	676.4	4.65E 04	3.68E-02	390.	44.5	17.24	4.98E 20	2.91E-09	2.94	14.29	567.	4.927E 04
11	668.1	4.34E 04	3.47E-02	387.	44.5	17.11	4.70E 20	3.09E-09	2.91	14.12	564.	5.284E 04
12	659.9	4.04E 04	3.27E-02	385.	44.5	16.90	4.43E 20	3.27E-09	2.88	13.95	560.	5.621E 04
13	651.6	3.76E 04	3.09E-02	383.	44.5	16.59	4.18E 20	3.47E-09	2.85	13.78	557.	5.939E 04
14	643.4	3.49E 04	2.90E-02	381.	44.5	16.49	3.93E 20	3.69E-09	2.82	13.61	553.	6.238E 04
15	635.1	3.24E 04	2.73E-02	378.	44.5	16.28	3.70E 20	3.92E-09	2.79	13.44	550.	6.520E 04
16	626.7	3.01E 04	2.57E-02	376.	44.5	16.13	3.48E 20	4.17E-09	2.76	13.27	546.	6.785E 04
17	618.3	2.79E 04	2.41E-02	374.	44.5	15.92	3.27E 20	4.44E-09	2.74	13.09	542.	7.034E 04
18	610.0	2.58E 04	2.27E-02	371.	44.5	15.71	3.07E 20	4.73E-09	2.71	12.92	539.	7.268E 04
19	601.6	2.39E 04	2.13E-02	369.	44.5	15.50	2.88E 20	5.04E-09	2.68	12.75	535.	7.487E 04
20	593.2	2.21E 04	1.99E-02	366.	44.5	15.29	2.70E 20	5.38E-09	2.65	12.57	531.	7.693E 04
21	584.7	2.04E 04	1.87E-02	364.	44.5	15.14	2.52E 20	5.75E-09	2.62	12.40	527.	7.886E 04
22	576.1	1.88E 04	1.75E-02	361.	44.5	14.92	2.36E 20	6.14E-09	2.59	12.22	524.	8.066E 04
23	567.6	1.73E 04	1.63E-02	359.	44.5	14.71	2.21E 20	6.57E-09	2.56	12.04	520.	8.235E 04
24	559.0	1.59E 04	1.52E-02	356.	44.5	14.49	2.06E 20	7.04E-09	2.54	11.86	516.	8.393E 04
25	550.5	1.46E 04	1.42E-02	354.	44.5	14.27	1.92E 20	7.54E-09	2.51	11.69	512.	8.540E 04
26	541.8	1.34E 04	1.32E-02	351.	44.5	14.12	1.79E 20	8.09E-09	2.48	11.51	508.	8.677E 04
27	533.1	1.23E 04	1.23E-02	349.	44.5	13.99	1.67E 20	8.69E-09	2.45	11.32	504.	8.805E 04
28	524.4	1.12E 04	1.15E-02	346.	44.5	13.67	1.55E 20	9.35E-09	2.42	11.14	500.	8.924E 04
29	515.7	1.03E 04	1.07E-02	343.	44.5	13.45	1.44E 20	1.01E-08	2.39	10.96	495.	9.034E 04
30	507.0	9.36E 03	9.88E-03	341.	44.5	13.23	1.34E 20	1.08E-08	2.36	10.78	491.	9.137E 04
31	498.1	8.53E 03	9.16E-03	338.	44.5	13.08	1.24E 20	1.17E-08	2.33	10.59	487.	9.232E 04
32	489.2	7.75E 03	8.48E-03	335.	44.5	12.85	1.15E 20	1.26E-08	2.29	10.41	482.	9.320E 04
33	480.2	7.04E 03	7.84E-03	332.	44.5	12.62	1.06E 20	1.37E-08	2.25	10.22	478.	9.402E 04
34	471.3	6.38E 03	7.24E-03	329.	44.5	12.39	9.80E 19	1.48E-08	2.22	10.04	474.	9.477E 04
35	462.4	5.77E 03	6.67E-03	326.	44.5	12.16	9.03E 19	1.61E-08	2.18	9.85	459.	9.549E 04
36	453.2	5.21E 03	6.09E-03	325.	44.5	11.95	8.25E 19	1.76E-08	2.16	9.74	466.	9.610E 04
37	445.0	4.70E 03	5.56E-03	323.	44.5	11.73	7.52E 19	1.93E-08	2.14	9.63	464.	9.668E 04
38	436.9	4.23E 03	5.06E-03	321.	44.5	11.50	6.86E 19	2.12E-08	2.12	9.53	461.	9.721E 04
39	428.9	3.81E 03	4.61E-03	320.	44.5	11.27	6.24E 19	2.32E-08	2.10	9.42	458.	9.770E 04
40	420.5	3.42E 03	4.19E-03	318.	44.5	11.04	5.68E 19	2.55E-08	2.08	9.31	456.	9.814E 04
41	412.6	3.07E 03	3.83E-03	315.	44.5	10.93	5.18E 19	2.80E-08	2.05	9.15	452.	9.854E 04
42	404.3	2.75E 03	3.49E-03	313.	44.5	10.74	4.73E 19	3.07E-08	2.02	8.99	448.	9.890E 04
43	413.2	2.46E 03	3.18E-03	310.	44.5	10.55	4.30E 19	3.37E-08	1.99	8.83	444.	9.924E 04
44	406.0	2.19E 03	2.89E-03	307.	44.5	10.36	3.91E 19	3.71E-08	1.96	8.67	440.	9.954E 04
45	399.0	1.95E 03	2.62E-03	305.	44.5	10.23	3.54E 19	4.10E-08	1.93	8.53	436.	9.981E 04

Table 4 (continued)

46	392.0	1.73E 03	2.37E-05	303.	44.5	9.35	3.20E 19	4.53E-08	1.89	8.38	45.2	9.54E 09	1.001E 05
47	395.0	1.54E 03	2.14E-03	300.	44.5	9.68	2.89E 19	5.02E-08	1.86	8.23	42.8	8.53E 09	1.003E 05
48	378.0	1.36E 03	1.92E-03	298.	44.5	9.51	2.61E 19	5.17E-08	1.82	8.09	42.4	7.62E 09	1.005E 05
49	369.2	1.20E 03	1.74E-03	294.	44.5	9.72	2.35E 19	6.16E-08	1.78	7.90	41.9	6.80E 09	1.007E 05
50	353.5	1.06E 03	1.57E-03	291.	44.5	9.69	2.12E 19	6.84E-08	1.74	7.72	41.4	6.06E 09	1.008E 05
51	351.7	9.26E 02	1.61E-03	288.	44.5	9.27	1.91E 19	7.01E-08	1.70	7.53	40.9	5.38E 09	1.010E 05
52	393.0	8.09E 02	1.26E-03	285.	44.5	9.34	1.71E 19	8.47E-08	1.66	7.35	40.4	4.76E 09	1.011E 05
53	393.0	7.05E 02	1.13E-03	281.	44.5	9.08	1.53E 19	9.06E-08	1.61	7.13	39.8	4.21E 09	1.012E 05
54	323.0	6.11E 02	1.01E-03	277.	44.5	8.81	1.37E 19	1.06E-07	1.57	6.92	39.2	3.71E 09	1.013E 05
55	313.0	5.28E 02	9.03E-04	273.	44.5	8.54	1.22E 19	1.19E-07	1.53	6.71	38.6	3.25E 09	1.014E 05
56	303.0	4.54E 02	8.01E-04	269.	44.5	8.27	1.08E 19	1.34E-07	1.48	6.50	38.0	2.84E 09	1.015E 05
57	294.5	3.88E 02	7.05E-04	266.	44.5	7.73	9.55E 18	1.52E-07	1.44	6.32	37.4	2.46E 09	1.016E 05
58	286.0	3.31E 02	6.19E-04	262.	44.5	7.51	8.37E 18	1.73E-07	1.40	6.14	36.9	2.13E 09	1.017E 05
59	277.5	2.80E 02	5.40E-04	259.	44.5	7.29	7.32E 18	1.98E-07	1.36	5.96	36.3	1.83E 09	1.018E 05
50	259.0	2.36E 02	4.70E-04	255.	44.5	7.07	6.36E 18	2.28E-07	1.32	5.78	35.8	1.57E 09	1.019E 05
51	265.2	1.99E 02	4.00E-04	254.	44.5	6.20	5.42E 18	2.64E-07	1.30	5.70	35.5	1.33E 09	1.018E 05
52	251.5	1.66E 02	3.40E-04	252.	44.5	6.11	4.61E 18	3.15E-07	1.28	5.62	35.3	1.12E 09	1.019E 05
53	257.7	1.39E 02	2.89E-04	250.	44.5	6.03	3.91E 18	3.71E-07	1.26	5.54	35.0	9.43E 08	1.019E 05
54	254.0	1.16E 02	2.44E-04	249.	44.5	5.94	3.31E 18	4.39E-07	1.25	5.46	34.8	7.92E 08	1.019E 05
55	250.0	9.64E 01	2.06E-04	247.	44.5	5.88	2.79E 18	5.19E-07	1.23	5.38	34.5	6.64E 08	1.019E 05
56	246.0	7.99E 01	1.74E-04	245.	44.5	5.79	2.35E 18	6.16E-07	1.21	5.29	34.2	5.55E 08	1.020E 05
57	242.0	6.61E 01	1.46E-04	243.	44.5	5.70	1.98E 18	7.34E-07	1.19	5.21	33.9	4.63E 08	1.020E 05
58	238.0	5.44E 01	1.22E-04	242.	44.5	5.51	1.66E 18	8.76E-07	1.17	5.12	33.7	3.84E 08	1.020E 05
59	234.0	4.47E 01	1.02E-04	240.	44.5	5.52	1.38E 18	1.05E-06	1.16	5.04	33.4	3.18E 08	1.020E 05
70	230.0	3.66E 01	8.52E-05	238.	44.5	5.42	1.15E 18	1.26E-06	1.14	4.96	33.1	2.63E 08	1.020E 05
71	226.0	2.99E 01	7.07E-05	236.	44.5	5.33	9.57E 17	1.52E-06	1.12	4.87	32.8	2.16E 08	1.020E 05
72	222.0	2.43E 01	5.85E-05	234.	44.5	5.24	7.92E 17	1.83E-06	1.11	4.79	32.5	1.77E 08	1.020E 05
73	218.2	1.97E 01	4.82E-05	232.	44.5	5.12	6.53E 17	2.22E-06	1.09	4.71	32.2	1.45E 08	1.020E 05
74	214.5	1.59E 01	3.96E-05	231.	44.5	5.03	5.33E 17	2.71E-06	1.07	4.63	31.9	1.18E 08	1.020E 05
75	210.7	1.28E 01	3.24E-05	229.	44.5	4.95	4.39E 17	3.31E-06	1.06	4.55	31.7	9.58E 07	1.020E 05
76	207.0	1.02E 01	2.64E-05	227.	44.5	4.86	3.58E 17	4.05E-06	1.04	4.47	31.4	7.74E 07	1.020E 05
77	204.5	8.16E 00	2.14E-05	226.	44.5	4.67	2.89E 17	5.02E-06	1.03	4.42	31.2	6.22E 07	1.020E 05
78	202.0	6.50E 00	1.72E-05	224.	44.5	4.51	2.48E 17	6.22E-06	1.02	4.36	31.0	4.98E 07	1.020E 05
79	199.5	5.16E 00	1.38E-05	223.	44.5	4.56	1.87E 17	7.74E-06	1.01	4.31	30.8	3.98E 07	1.020E 05
80	197.0	4.09E 00	1.11E-05	222.	44.5	4.50	1.50E 17	9.65E-06	0.99	4.26	30.6	3.17E 07	1.020E 05
31	193.7	3.23E 00	8.91E-06	220.	44.5	4.51	1.21E 17	1.20E-05	0.97	4.19	30.4	2.52E 07	1.020E 05
32	190.5	2.54E 00	7.12E-06	218.	44.5	4.43	9.64E 16	1.50E-05	0.94	4.12	30.1	2.00E 07	1.020E 05
83	187.2	1.99E 00	5.67E-06	217.	44.5	4.36	7.68E 16	1.89E-05	0.92	4.05	29.9	1.58E 07	1.020E 05
84	184.0	1.55E 00	4.50E-06	215.	44.5	4.28	6.09E 16	2.38E-05	0.90	3.98	29.6	1.24E 07	1.020E 05
85	180.7	1.20E 00	3.56E-06	213.	44.5	4.21	4.82E 16	3.01E-05	0.88	3.91	29.3	9.73E 06	1.020E 05
36	177.5	9.29E-01	2.80E-06	211.	44.5	4.14	3.79E 16	3.83E-05	0.86	3.84	29.1	7.59E 06	1.020E 05
87	174.2	7.14E-01	4.19E-06	209.	44.5	4.06	2.97E 16	4.89E-05	0.84	3.78	28.8	5.89E 06	1.020E 05
88	171.0	5.47E-01	1.71E-06	208.	44.5	3.99	2.32E 16	6.27E-05	0.82	3.71	28.5	4.55E 06	1.020E 05
90	173.0	4.18E-01	1.29E-06	209.	44.5	3.59	1.75E 16	8.29E-05	0.83	3.75	28.7	3.46E 06	1.020E 05
37	174.6	2.46E-01	7.55E-07	210.	44.5	3.54	1.33E 16	1.09E-04	0.84	3.79	28.8	2.64E 06	1.020E 05
92	174.3	1.89E-01	5.81E-07	209.	44.5	3.82	1.02E 16	1.42E-04	0.84	3.79	28.8	2.03E 06	1.020E 05
33	173.9	1.45E-01	4.47E-07	209.	44.5	3.81	7.86E 15	1.85E-04	0.84	3.78	28.8	1.56E 06	1.020E 05
94	173.6	1.11E-01	3.43E-07	209.	44.5	3.30	6.05E 15	2.40E-04	0.84	3.77	28.8	1.20E 06	1.020E 05
95	173.2	8.54E-02	2.64E-07	209.	44.5	3.30	4.65E 15	3.12E-04	0.83	3.77	28.7	9.21E 05	1.020E 05
38	172.8	6.55E-02	2.03E-07	209.	44.5	3.79	3.57E 15	4.06E-04	0.83	3.76	28.7	7.07E 05	1.020E 05
96					44.5	3.79	2.74E 15	5.29E-04	0.83	3.76	28.7	5.42E 05	1.020E 05

Table 4 (continued)

37	172.5	5.02E-02	1.56E-07	44.5	3.77	2.11E 15	6.89E-04	0.83	3.75	28.6	4.16E 05	1.020E 05
38	172.1	3.84E-02	1.19E-07	44.5	3.77	1.62E 15	8.98E-04	0.83	3.75	28.6	3.19E 05	1.020E 05
39	171.8	2.94E-02	9.16E-08	44.5	3.77	1.24E 15	1.17E-03	0.82	3.74	28.6	2.44E 05	1.020E 05
130	171.4	2.25E-02	7.02E-08	44.5	3.76	9.50E 14	1.531E-03	0.84	3.80	28.8	1.87E 05	1.020E 05
131	174.7	1.72E-02	5.28E-08	44.5	3.51	7.15E 14	2.03E-03	0.84	3.80	28.8	1.42E 05	1.020E 05
132	178.1	1.33E-02	3.99E-08	44.5	3.51	5.41E 14	2.68E-03	0.86	3.88	29.1	1.08E 05	1.020E 05
133	176.1	1.03E-02	3.04E-08	44.5	3.58	4.11E 14	3.53E-03	0.88	3.95	29.4	8.32E 04	1.020E 05
134	164.8	8.01E-03	2.32E-08	44.5	3.75	3.14E 14	4.62E-03	0.91	4.03	29.7	6.42E 04	1.020E 05
135	138.1	6.26E-03	1.78E-08	44.5	3.52	2.48E 14	6.07E-03	0.93	4.10	29.9	4.97E 04	1.020E 05
136	191.5	4.92E-03	1.37E-08	44.5	3.39	1.86E 14	7.80E-03	0.95	4.17	30.2	3.87E 04	1.020E 05
137	194.8	3.88E-03	1.07E-08	44.5	3.96	1.44E 14	1.01E-02	1.00	4.25	30.4	3.03E 04	1.020E 05
138	198.1	3.07E-03	8.29E-09	44.5	4.03	1.12E 14	1.29E-02	1.00	4.32	30.7	2.38E 04	1.020E 05
139	211.5	2.44E-03	6.48E-09	44.5	4.10	8.78E 13	1.65E-02	1.02	4.40	31.0	1.87E 04	1.020E 05
140	224.8	1.95E-03	5.09E-09	44.5	4.07	6.89E 13	2.11E-02	1.03	4.47	31.2	1.48E 04	1.020E 05
141	210.6	1.56E-03	3.97E-09	44.5	4.58	5.37E 13	2.70E-02	1.06	4.60	31.7	1.17E 04	1.020E 05
142	216.4	1.26E-03	3.12E-09	44.5	4.76	4.22E 13	3.44E-02	1.08	4.73	32.1	9.34E 03	1.020E 05
143	222.2	1.02E-03	2.46E-09	44.5	4.31	3.34E 13	4.35E-02	1.11	4.86	32.5	7.48E 03	1.020E 05
144	228.0	8.35E-04	1.96E-09	44.5	4.42	2.65E 13	5.47E-02	1.13	4.98	32.9	6.02E 03	1.020E 05
145	233.8	6.85E-04	1.57E-09	44.5	4.54	2.12E 13	6.84E-02	1.16	5.11	33.4	4.88E 03	1.020E 05
146	239.6	5.65E-04	1.26E-09	44.5	4.55	1.71E 13	8.50E-02	1.18	5.24	33.8	3.97E 03	1.020E 05
147	245.4	4.68E-04	1.02E-09	44.5	4.78	1.38E 13	1.05E-01	1.21	5.37	34.2	3.25E 03	1.020E 05
148	251.2	3.89E-04	8.29E-10	44.5	4.88	1.12E 13	1.29E-01	1.23	5.50	34.6	2.67E 03	1.020E 05
149	257.0	3.25E-04	6.77E-10	44.5	4.99	9.16E 12	1.58E-01	1.26	5.63	35.0	2.21E 03	1.020E 05
120	262.8	2.73E-04	5.55E-10	44.5	5.11	7.52E 12	1.93E-01	1.29	5.75	35.4	1.83E 03	1.020E 05
121	270.6	2.30E-04	4.54E-10	44.5	5.07	5.15E 12	2.35E-01	1.32	5.93	35.9	1.52E 03	1.020E 05
122	279.3	1.95E-04	3.74E-10	44.5	5.21	5.06E 12	2.87E-01	1.36	6.10	36.4	1.27E 03	1.020E 05
123	286.1	1.65E-04	3.10E-10	44.5	5.36	4.19E 12	3.46E-01	1.40	6.27	36.9	1.07E 03	1.020E 05
124	293.8	1.41E-04	2.58E-10	44.5	5.51	3.49E 12	4.15E-01	1.44	6.44	37.4	8.98E 02	1.020E 05
125	301.6	1.21E-04	2.15E-10	44.5	5.65	2.91E 12	4.98E-01	1.48	6.61	37.9	7.61E 02	1.020E 05
126	309.3	1.04E-04	1.81E-10	44.5	5.80	2.45E 12	5.93E-01	1.51	6.79	38.4	6.47E 02	1.020E 05
127	317.1	9.03E-05	1.52E-10	44.5	5.95	2.06E 12	7.03E-01	1.54	6.96	38.8	5.53E 02	1.020E 05
128	324.8	7.84E-05	1.29E-10	44.5	6.10	1.75E 12	8.30E-01	1.58	7.13	39.3	4.74E 02	1.020E 05
129	332.6	6.82E-05	1.10E-10	44.5	6.24	1.49E 12	9.75E-01	1.61	7.30	39.8	4.08E 02	1.020E 05
130	340.3	5.96E-05	9.37E-11	44.5	6.39	1.27E 12	1.14E 00	1.65	7.48	40.2	3.52E 02	1.020E 05
131	349.0	5.22E-05	8.01E-11	44.5	6.44	1.08E 12	1.34E 00	1.69	7.67	40.8	3.05E 02	1.020E 05
132	357.6	4.59E-05	5.87E-11	44.5	6.50	9.30E 11	1.56E 00	1.73	7.86	41.3	2.64E 02	1.020E 05
133	366.3	4.05E-05	5.52E-11	44.5	6.77	8.01E 11	1.81E 00	1.77	8.05	41.8	2.30E 02	1.020E 05
134	374.9	3.58E-05	5.11E-11	44.5	6.93	6.92E 11	2.10E 00	1.81	8.25	42.2	2.02E 02	1.020E 05
135	383.6	3.18E-05	4.43E-11	44.5	7.09	5.00E 11	2.42E 00	1.85	8.44	42.7	1.77E 02	1.020E 05
136	392.2	2.83E-05	3.86E-11	44.5	7.25	5.22E 11	2.73E 00	1.89	8.63	43.2	1.55E 02	1.020E 05
137	400.9	2.52E-05	3.36E-11	44.5	7.42	6.55E 11	3.19E 00	1.94	8.83	43.7	1.37E 02	1.020E 05
138	409.5	2.25E-05	2.94E-11	44.5	7.58	8.99E 11	3.64E 00	1.97	9.02	44.1	1.21E 02	1.020E 05
139	419.2	2.02E-05	2.58E-11	44.5	7.74	3.50E 11	4.15E 00	2.00	9.21	44.6	1.08E 02	1.020E 05
140	426.8	1.81E-05	2.27E-11	44.5	7.90	3.08E 11	4.71E 00	2.04	9.41	45.1	9.56E 01	1.020E 05
141	435.2	1.63E-05	2.00E-11	44.2	7.80	2.72E 11	5.33E 00	2.07	9.65	45.6	8.55E 01	1.020E 05
142	443.5	1.47E-05	1.76E-11	44.0	7.38	2.41E 11	6.03E 00	2.10	9.89	46.2	7.67E 01	1.020E 05
143	451.9	1.33E-05	1.55E-11	43.8	8.16	2.14E 11	6.79E 00	2.14	10.14	46.8	6.89E 01	1.020E 05
144	450.2	1.21E-05	1.38E-11	43.5	8.34	1.90E 11	7.62E 00	2.17	10.38	47.3	6.21E 01	1.020E 05
145	468.6	1.10E-05	1.22E-11	43.3	8.52	1.70E 11	8.53E 00	2.21	10.64	47.9	5.61E 01	1.020E 05
146	475.9	1.00E-05	1.09E-11	43.0	8.71	1.52E 11	9.53E 00	2.24	10.89	48.4	5.08E 01	1.020E 05
147	485.3	9.16E-06	9.71E-12	43.0	8.39	1.37E 11	1.06E 01	2.28	11.15	49.0	4.62E 01	1.020E 05
148	493.6	8.38E-06	8.69E-12	42.5	9.08	1.23E 11	1.13E 01	2.31	11.41	49.6	4.20E 01	1.020E 05
149	502.0	7.68E-06	7.79E-12	42.3	9.27	1.11E 11	1.31E 01	2.34	11.67	50.1	3.83E 01	1.020E 05

Table 4 (continued)

150	510.3	7.06E-06	7.06E-17	42.1	9.45	1.20E 11	1.45E 01	2.37	11.94	507.	3.50E 01	1.020E 05
151	315.1	4.50E-06	5.35E-12	41.9	10.32	9.12E 10	1.59E 01	2.39	12.11	510.	3.21E 01	1.020E 05
152	51.8	5.98E-06	5.76E-12	41.8	10.47	8.31E 10	1.75E 01	2.41	12.29	514.	2.94E 01	1.020E 05
153	527.6	5.52E-06	5.24E-12	41.7	10.61	7.58E 10	1.91E 01	2.43	12.47	518.	2.71E 01	1.020E 05
154	533.3	5.10E-06	4.77E-12	41.5	10.75	5.92E 10	2.10E 01	2.45	12.65	521.	2.49E 01	1.020E 05
155	539.1	4.71E-06	4.35E-12	41.4	10.90	6.33E 10	2.29E 01	2.47	12.83	525.	2.27E 01	1.020E 05
156	544.8	4.31E-06	3.97E-12	41.3	11.04	5.80E 10	2.50E 01	2.49	13.01	529.	2.11E 01	1.020E 05
157	550.6	4.04E-06	3.63E-12	41.1	11.19	5.32E 10	2.73E 01	2.51	13.20	532.	1.95E 01	1.020E 05
158	556.3	3.75E-06	3.32E-12	41.0	11.33	4.88E 10	2.97E 01	2.53	13.38	536.	1.80E 01	1.020E 05
159	562.1	3.48E-06	3.04E-12	40.9	11.48	4.49E 10	3.23E 01	2.55	13.57	540.	1.67E 01	1.020E 05
160	567.8	3.23E-06	2.79E-12	40.7	11.63	4.13E 10	3.52E 01	2.56	13.76	543.	1.55E 01	1.020E 05
161	573.5	3.01E-06	2.56E-12	40.6	11.77	3.80E 10	3.82E 01	2.58	13.95	547.	1.43E 01	1.020E 05
162	579.3	2.80E-06	2.35E-12	40.5	11.92	3.50E 10	4.14E 01	2.60	14.14	551.	1.33E 01	1.020E 05
163	585.0	2.61E-06	2.15E-12	40.3	12.07	3.23E 10	4.48E 01	2.62	14.33	554.	1.24E 01	1.020E 05
164	590.7	2.44E-06	1.99E-12	40.2	12.22	2.99E 10	4.85E 01	2.64	14.52	558.	1.15E 01	1.020E 05
165	596.5	2.28E-06	1.84E-12	40.1	12.37	2.76E 10	5.25E 01	2.66	14.72	561.	1.07E 01	1.020E 05
166	602.2	2.13E-06	1.70E-12	39.9	12.52	2.56E 10	5.67E 01	2.68	14.91	565.	9.97E 00	1.020E 05
167	607.9	1.99E-06	1.57E-12	39.8	12.67	2.37E 10	6.12E 01	2.70	15.11	569.	9.30E 00	1.020E 05
168	613.7	1.86E-06	1.45E-12	39.7	12.83	2.20E 10	6.59E 01	2.72	15.31	572.	8.68E 00	1.020E 05
169	619.4	1.75E-06	1.34E-12	39.5	12.98	2.04E 10	7.13E 01	2.74	15.51	576.	8.11E 00	1.020E 05
170	625.1	1.64E-06	1.24E-12	39.4	13.13	1.90E 10	7.64E 01	2.76	15.71	580.	7.58E 00	1.020E 05
171	631.2	1.54E-06	1.16E-12	39.2	13.28	1.78E 10	8.17E 01	2.77	15.84	583.	7.12E 00	1.020E 05
172	637.3	1.44E-06	1.08E-12	39.1	13.42	1.66E 10	8.73E 01	2.77	15.96	586.	6.69E 00	1.020E 05
173	641.5	1.36E-06	1.00E-12	38.9	13.57	1.56E 10	9.32E 01	2.77	16.09	589.	6.29E 00	1.020E 05
174	646.2	1.28E-06	9.37E-13	38.7	13.72	1.46E 10	9.95E 01	2.78	16.22	592.	5.92E 00	1.020E 05
175	651.7	1.20E-06	8.75E-13	38.5	13.87	1.37E 10	1.06E 02	2.80	16.35	591.	5.57E 00	1.020E 05
176	657.8	1.13E-06	8.17E-13	38.4	14.02	1.28E 10	1.13E 02	2.80	16.49	593.	5.24E 00	1.020E 05
177	663.9	1.06E-06	7.63E-13	38.2	14.17	1.20E 10	1.21E 02	2.81	16.62	595.	4.94E 00	1.020E 05
178	669.1	1.00E-06	7.13E-13	38.0	14.32	1.13E 10	1.29E 02	2.82	16.75	598.	4.65E 00	1.020E 05
179	674.2	9.43E-07	6.67E-13	37.9	14.47	1.06E 10	1.37E 02	2.82	16.89	600.	4.39E 00	1.020E 05
180	679.3	8.89E-07	6.24E-13	37.7	14.62	1.00E 09	1.46E 02	2.83	17.03	602.	4.14E 00	1.020E 05
181	684.6	8.38E-07	5.86E-13	37.5	14.77	9.39E 09	1.54E 02	2.83	17.11	605.	3.91E 00	1.020E 05
182	689.6	7.91E-07	5.50E-13	37.4	14.92	8.86E 09	1.64E 02	2.83	17.19	608.	3.69E 00	1.020E 05
183	694.7	7.46E-07	5.17E-13	37.2	15.07	8.36E 09	1.74E 02	2.83	17.27	610.	3.49E 00	1.020E 05
184	699.9	7.04E-07	4.86E-13	37.1	15.22	7.89E 09	1.84E 02	2.83	17.35	613.	3.30E 00	1.020E 05
185	705.0	6.65E-07	4.57E-13	36.9	15.37	7.44E 09	1.95E 02	2.83	17.43	616.	3.12E 00	1.020E 05
186	710.1	6.28E-07	4.29E-13	36.8	15.52	7.03E 09	2.06E 02	2.83	17.51	619.	2.96E 00	1.020E 05
187	715.3	5.93E-07	4.04E-13	36.6	15.67	6.64E 09	2.19E 02	2.84	17.59	617.	2.80E 00	1.020E 05
188	720.4	5.60E-07	3.80E-13	36.5	15.82	6.27E 09	2.31E 02	2.84	17.68	612.	2.65E 00	1.020E 05
189	725.5	5.30E-07	3.57E-13	36.3	15.97	5.93E 09	2.45E 02	2.84	17.76	614.	2.51E 00	1.020E 05
190	730.6	5.01E-07	3.36E-13	36.2	16.12	5.60E 09	2.59E 02	2.84	17.84	616.	2.38E 00	1.020E 05
191	735.7	4.74E-07	3.17E-13	36.0	16.27	5.29E 09	2.74E 02	2.84	17.93	617.	2.25E 00	1.020E 05
192	740.8	4.48E-07	2.98E-13	35.9	16.42	5.01E 09	2.90E 02	2.84	18.02	618.	2.13E 00	1.020E 05
193	745.9	4.24E-07	2.81E-13	35.7	16.57	4.74E 09	3.05E 02	2.84	18.10	620.	2.02E 00	1.020E 05
194	750.9	4.01E-07	2.65E-13	35.6	16.72	4.48E 09	3.21E 02	2.84	18.19	621.	1.92E 00	1.020E 05
195	755.8	3.80E-07	2.49E-13	35.4	16.87	4.24E 09	3.37E 02	2.84	18.28	623.	1.82E 00	1.020E 05
196	760.5	3.59E-07	2.35E-13	35.3	17.02	4.02E 09	3.51E 02	2.84	18.37	624.	1.73E 00	1.020E 05
197	765.6	3.40E-07	2.22E-13	35.1	17.17	3.80E 09	3.67E 02	2.84	18.46	626.	1.64E 00	1.020E 05
198	770.6	3.23E-07	2.09E-13	34.9	17.32	3.60E 09	3.83E 02	2.84	18.55	627.	1.56E 00	1.020E 05
199	775.9	3.06E-07	1.97E-13	34.8	17.47	3.41E 09	4.00E 02	2.84	18.64	628.	1.48E 00	1.020E 05
200	781.1	2.90E-07	1.86E-13	34.6	17.62	3.23E 09	4.17E 02	2.84	18.73	630.	1.40E 00	1.020E 05

T A B L E 5

Comparison of the computed and measured number densities
by Venera 9 and 10 (80-90 km altitude).

H (km)	N mol/cm ³ Computed values Chemical composition 2	N mol/cm ³ Measured values Venera 9 and 10	N mol/cm ³ Computed values Chemical composition 3
80	$1,89 \times 10^{17}$	$1,83 \times 10^{17}$	$1,50 \times 10^{17}$
82	$1,32 \times 10^{17}$	$1,26 \times 10^{16}$	$9,64 \times 10^{16}$
84	$8,87 \times 10^{16}$	$7,20 \times 10^{16}$	$6,09 \times 10^{16}$
86	$5,57 \times 10^{16}$	$4,50 \times 10^{16}$	$3,79 \times 10^{16}$
88	$3,37 \times 10^{16}$	$2,70 \times 10^{16}$	$2,31 \times 10^{16}$
90	$1,93 \times 10^{16}$	$1,50 \times 10^{16}$	$1,33 \times 10^{16}$

T A B L E 6

Comparison of the computed and measured pressures
by Venera 9 and 10 (80-90 km altitude).

H (km)	P (mb) Computed values Chemical composition 2	P (mb) Measured values Venera 9 and 10	P (mb) Computed values Chemical composition
80	$4,09 \times 10^0$	$4,97 \times 10^0$	$5,52 \times 10^0$
82	$2,51 \times 10^0$	$3,60 \times 10^0$	$2,54 \times 10^0$
84	$2,14 \times 10^0$	$1,82 \times 10^0$	$1,55 \times 10^0$
86	$9,16 \times 10^{-1}$	$9,10 \times 10^0$	$2,28 \times 10^{-1}$
88	$6,99 \times 10^{-1}$	$6,38 \times 10^{-1}$	$5,46 \times 10^{-1}$
90	$3,74 \times 10^{-1}$	$3,65 \times 10^{-1}$	$3,21 \times 10^{-1}$

T A B L E 7

Computed values of Density (gr/cm³).

(Km) Altitude	Chemical composition (1)	Chemical composition (2)	Chemical composition (3)	Pioneer measurements
150	$1,17 \times 10^{-12}$	$7,08 \times 10^{-12}$	7×10^{-12}	$0,18 \times 10^{-12}$
160	$4,68 \times 10^{-12}$	$2,83 \times 10^{-12}$	$2,79 \times 10^{-12}$	$0,10 \times 10^{-12}$
170	$20,8 \times 10^{-13}$	$12,6 \times 10^{-13}$	$12,4 \times 10^{-13}$	$0,4 \times 10^{-13}$
180	$10,5 \times 10^{-13}$	$6,32 \times 10^{-13}$	$6,24 \times 10^{-13}$	$0,2 \times 10^{-13}$
190	$5,64 \times 10^{-13}$	$3,41 \times 10^{-13}$	$5,36 \times 10^{-13}$	—
200	$3,12 \times 10^{-13}$	$1,89 \times 10^{-13}$	$1,86 \times 10^{-13}$	$0,12 \times 10^{-14}$

Π Ε Ρ Ι Λ Η Ψ Ι Σ

Εἰς μίαν προγενεστέραν ἐργασίαν μας ὑπελογίσαμε τὰς φυσικὰς παραμέτρους τῆς ἀτμοσφαίρας τῆς Ἀφροδίτης συναρτήσει τοῦ ὕψους διὰ διαφόρους χημικὰς συνθέσεις πού περιεῖχαν SO_2 . Αἱ τιμαὶ αὐτῶν τῶν φυσικῶν παραμέτρων δύνανται νὰ χρησιμοποιηθοῦν διὰ τὴν μελέτην τῆς κατωτέρας ἀτμοσφαίρας τῆς Ἀφροδίτης (0 - 50 km). Μεταγενεστέως διεπιστώθη ὑπὸ τοῦ Pioneer ἡ ὑπαρξίς SO_2 ἐντὸς τῆς ἀτμοσφαίρας τῆς Ἀφροδίτης.

Εἰς τὴν παροῦσαν ἐργασίαν ὑπελογίσαμε τὰς φυσικὰς παραμέτρους τῆς ἀτμοσφαίρας τῆς Ἀφροδίτης συναρτήσει τοῦ ὕψους διὰ διαφόρους χημικὰς συνθέσεις πού περιέχουν τὸ σύμπλοκον μόριον $\text{CO}_2 \cdot \text{CO}_2^+$.

Τὸ μόριον αὐτὸ εἶναι πιθανὸν νὰ σχηματίζεται εἰς τὰ ἀνώτερα στρώματα τῆς ἀτμοσφαίρας τοῦ πλανήτου καὶ νὰ ἀποτελῇ τὸ κύριον συστατικὸν μιᾶς ὀμίχλης πού παρατήρησεν ὁ Mariner 10. Συνεκρίναμε τὰς ὑπολογισθείσας τιμὰς πίεσεως καὶ πυκνότητος μὲ τὰς μετρηθείσας ὑπὸ τῶν διαστημοπλοίων Venera 9, Venera 10 καὶ διεπιστώσαμεν ὅτι αἱ ὑπολογισθεῖσαι τιμαὶ συμπίπτουν μὲ τὰς μετρηθείσας εἰς τὰ ὕψη 80 - 90 km ἐφ' ὅσον τὸ ποσοστὸν τοῦ $\text{CO}_2 \cdot \text{CO}_2^+$ περιέχεται μεταξὺ τῶν τιμῶν 1,5% - 2,5%.

Αἱ φυσικαὶ παράμετροι τὰς ὁποίας ὑπελογίσαμε δύνανται συνεπῶς νὰ χρησιμοποιηθοῦν διὰ τὴν μελέτην τῆς ἀνωτέρας ἀτμοσφαίρας τῆς Ἀφροδίτης, (50 - 200 km) καὶ νὰ μελετηθῇ βάσει αὐτῶν ὁ σχηματισμὸς τοῦ μορίου $\text{CO}_2 \cdot \text{CO}_2^+$.

Ἐνω τῶν 150 km, συνεκρίναμε τὰς ὑπολογισθείσας τιμὰς πυκνότητος πρὸς τὰς μετρηθείσας ὑπὸ τοῦ Pioneer καὶ εὔρομεν ὅτι αἱ ὑπολογισθεῖσαι τιμαὶ εἶναι μεγαλύτεραι τῶν μετρηθεισῶν. Τοῦτο ἀπεδώσαμεν εἰς τὸ γεγονὸς ὅτι αἱ μετρήσεις τῶν Venera 9 καὶ Venera 10 ἔγιναν πλησίον τοῦ ἐλαχίστου τῆς ἡλιακῆς δραστηριότητος ἐνῶ αἱ μετρήσεις τοῦ Pioneer πλησίον τοῦ μεγίστου. Ἡ ἡλιακὴ δραστηριότης κρίνεται ὅτι παίζει σημαντικὸν ρόλον εἰς τὸν σχηματισμὸν τοῦ $\text{CO}_2 \cdot \text{CO}_2^+$ εἰς τὰ ἀνώτερα στρώματα τῆς ἀτμοσφαίρας τῆς Ἀφροδίτης.

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