1991

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## Recommended Citation

Lynch, J.P., Kafatos, M. (1991). Forbidden Lines of np^q Ions. II. Line Intensities, *Astrophysical Journal Supplement Series*, 76:1169-1191. doi: 10.1086/191595

THE ASTROPHYSICAL JOURNAL SUPPLEMENT SERIES, 76:1169–1191, 1991 August


# FORBIDDEN LINES OF $np^q$ IONS. II. LINE INTENSITIES

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*Received 1990 October 3; accepted 1991 January 4*

## ABSTRACT

Ground state forbidden transitions of $np^q$ ions of C, N, O, Ne, Mg, Si, S, and Fe can provide important information on the state of cosmic ionized gases. Wavelengths of these lines are in the far- and near-UV, visible, and near- and far-IR regions of the spectrum. The line intensity ratios of particular transitions in $q = 2, 4$ ions can provide information on the temperature of the gas and in $q = 3$ ions information on the density of the gas. In the present work we have tabulated the line intensities of 95 transitions of these ions, which include those used to calculate the line ratios as well as other strong lines of the ions in the ground state terms in the same temperature and density ranges treated previously. These data can be used for calculations of the absolute line intensities if the ionic abundances are known. We have also graphed 25 of the most interesting cases. These calculations are important for studies of the solar transition region, ionized nebulae, circumstellar nebulae such as found in symbiotic stars, supernova remnants, interstellar bubbles produced by stellar winds, and emission regions in active galactic nuclei.

*Subject heading:* atomic processes

## 1. INTRODUCTION

Forbidden transitions in the ground state of $np^q$ ions can make a significant contribution to the cooling of the hot ($10^4 \lesssim T \lesssim 10^6$ K) component of the interstellar medium. The strengths of these lines have been computed theoretically and applied to observations of gaseous nebulae (see Kafatos & Lynch 1980, and references therein). Many of the lines examined in the literature are in the visible or near-ultraviolet (UV) region of the spectrum. However, forbidden lines in the far-UV as well as the near- and far-infrared (IR) regions of the spectrum have been studied for interstellar gas regions (e.g., Delmer, Gould, & Ramsay 1967; Jordan 1971; Flower & Nussbaumer 1975), galaxies and the extreme ultraviolet (EUV) solar spectrum. Ratios of forbidden lines for particular transitions of an ion can provide a means of determining the temperature of the gas (Menzel, Aller, & Hebb 1941) or the density (Seaton 1954) of the gas.

A complete set of calculations for these forbidden lines was performed by Kafatos & Lynch (1980, hereafter Paper I). In that work, detailed calculations of the relative populations of the levels of the ground state as a function of temperature and density were presented for the ions of C, N, O, Ne, Mg, Si, S, and Fe with electron configurations $np^q$, where $n = 2$, 3 and $q = 1, 2, 3, 4, 5$. Calculations of the line ratios were also performed and shown graphically. We solved the detailed balance equations in the ground state terms of 37 ions of C, N, O, Ne, Mg, Si, S, and Fe; tabulated the atomic data for 235 transitions of these ions and the relative populations of the various levels for temperatures where the ions are abundant and densities in the range 1–$10^{10}$ cm$^{-3}$; and graphed 22 line ratios. Although these are not the only elements with $np^q$ ions, they are the most cosmically abundant heavy elements and their lines are expected in general to be stronger than less abundant elements. We also limited the study to ions which are expected to be important in the approximate temperature range $5 \times 10^3$–$2 \times 10^6$ K. These temperatures span the range in which the relevant ions are abundant (more than a few percent).

In this work, we present detailed calculations of the line intensities of 95 forbidden line transitions, which include those used for line ratio calculations treated previously as well as other strong lines of these ions in the ground state terms. We have provided results for temperatures where the ions are abundant (above 5% relative ionic abundance) in the same temperature range treated previously. Radiative cooling of the hot plasma is high in this range, and it achieves its maximum value at $T \approx 10^5$ K (Cox & Tucker 1969; Kafatos 1973). The solar transition region and the interstellar gas under widely different conditions lie in this range: H II regions and planetary nebulae at the low end of the temperature range; cooling supernova shocks in the isothermal phase (Spitzer 1978); interstellar bubbles at the high end of the temperature range (Castor, McCray, & Weaver 1975); and AGN emission-line regions (see Osterbrock & Mathews 1986). We calculated line intensities using densities in the range 1–$10^{10}$ cm$^{-3}$. Moreover, the results depend on the values of the electron density, temperature, ionic abundance, and chemical abundance.

With the information in this and the previous work, the researcher can calculate the absolute line intensity of any transition in the ground state terms for the ions treated if the relative ionic abundance is known. We also present 25 graphs of

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the line intensities as a function of temperature and density for the most interesting cases. The results are easily accessible to the reader for quick estimates of line emissivities as long as the reddening is known.

## 2. DATA AND EQUATIONS

The line intensity can be found from the following equation (see Paper I),

$$I_{ji}/n^2N_{A,Z} = A_{ji}N_jN_A h\nu_{ji}\frac{1}{n(1+N_{\rm He})}L/4\pi \text{ ergs cm}^{-2}\text{ s}^{-1}\text{ sr}^{-1} \quad (1)$$

where $A_{ji}$ is the radiative transition probability from the upper level $j$ to the lower level $i$, $N_j$ is the relative population of level $j$, $N_A$I, $c_Z$ is the relative ionic abundance of ion with charge $Z$ of element with atomic number $A$, $N_A$ is the chemical abundance with respect to hydrogen, $\nu_{ji}$ is the frequency of the transition, $N_{\rm He}$ is the relative chemical abundance of helium, $n$ is the total number density of hydrogen and helium nuclei (where $n = n_{\rm H} + n_{\rm He}$ cm$^{-3}$), and $L$ is the path length through the line emitting region. We use the convention that capital letters $N$ refer to relative abundances while lower case letters $n$ refer to number densities.

It is obvious from equation (1) that the line intensity can be determined once the relative populations of the levels have been computed and if the ionic abundance is known. The latter depends on the specific region under consideration (for example, purely collisional ionization would produce a different abundance from radiative ionization, etc.). The relative population of the level $N_j$ is a function of temperature and density only.

It is evident from equation (1) that the relative populations $N_j$ are needed to calculate the term on the left side of the equality. In Paper I, we computed the relative populations $N_j$, $j = 1, 2, 3, 4, 5$ for the $n = 2, 3$ and $q = 2, 3, 4$ $np^q$ ions, and the relative populations $N_j$, $j = 1, 2$ for the $n = 2, 3$ and $q = 1, 5$ $np^q$ ions, where it was assumed that cascades from higher levels do not populate the ground state levels. For the exact sequence of the lowest level and excited levels see Paper I.

The atomic data needed to compute $N_j$ are the energy differences between levels for the relevant transitions, the radiative transition probabilities, and collision strengths. The previous work also provides a complete discussion of the atomic data used and the sources of this data as well as the formulae for the calculations of the relative populations in a five level $np^q$ ground state term. The $N_j$ values are computed from the balance equations which give the relative number of ions in each level $j$ determined by balancing collisional excitation from levels $i$ to $j$ $(i < j)$ and from $j$ to $k$ $(k > j)$, collisional de-excitation from levels $k$ to $j$ and from $j$ to $i$, and radiative transitions from levels $k$ to $j$ and from $j$ to $i$. Here we have, however, used different and improved values for the wavelengths for some of the transitions provided in the tables compared to those values given in the previous work if a source with more extensive computations was available. These differences in wavelengths did not significantly affect the results compared to the previous calculations found in Paper I. For transitions of the ions N I through S IX, Wiese, Smith, & Glennon (1966a, hereafter WSG 1966a, and 1966b, hereafter WSG 1966b) were used as sources for wavelength data. For transitions of the ions S X and S XI, Edlén (1972) was used. For transitions of the ions Fe XI through Fe XIII, Smith & Wiese (1973) was used. For transitions of the ions C II through S XII, WSG (1966b) was used. Finally, for transitions of the ions Fe X and Fe XIV, the work of Czyzak, Aller, & Euwema (1974) was used.

## 3. RESULTS AND CONCLUSIONS

Using the data discussed in the previous section, we now present the results of our computations. Detailed results of the line intensity calculations are shown in Tables 1A–37 (see Appendix B): N I, Table 1 (letter designation, e.g., 1A, 1B, etc., indicates individual transitions for that ion); N II, 2; O I, 3; O II, 4; O III, 5; Ne III, 6; Ne IV, 7; Ne V, 8; Mg V, 9; Mg VI, 10; Mg VII, 11; Si VII, 12; Si VIII, 13; Si IX, 14; S II, 15; S III, 16; S IX, 17; S X, 18; S XI, 19; Fe XI, 20; Fe XII, 21; Fe XIII, 22; C II, 23; N III, 24; O IV, 25; Ne II, 26; Ne VI, 27; Mg IV, 28; Mg VIII, 29; Si II, 30; Si VI, 31; Si X, 32; S IV, 33; S VIII, 34; S XII, 35; Fe X, 36; and Fe XIV, 37. These line intensities were used previously to calculate the line ratios presented in Paper I. In each of the above tables we have provided the data in terms of the negative logarithm of the term $I_{ji}/n^2N_{A,Z}$ for various values of the logarithm of temperature $T$ and the logarithm of density $n$.

We present the results as a function of the total density $n$ rather than $n_e$ because the electron number density could vary in a time-dependent situation as the gas recombined and could not be used as a general parameter. Below $T \approx 10^4$ K the results are, therefore, strictly correct for a gas that is cooling radiatively (see Kafatos 1973; Shapiro & Moore 1976), although the results should also apply with satisfactory agreement to cases where there is no time variation of the electron density (like H II regions). Also, our results apply generally for $T \gtrsim 10^4$ K independently of the ionizing process. Since specific ions persist over a larger temperature range in the time-dependent case compared to the steady-state ionization case (in which recombinations balance collisional ionizations), the temperature ranges given in Tables 1A–37 should be adequate for most purposes.

Forbidden line intensity ratios of the same ion can provide accurate determinations of densities and temperatures. For ions with ground state configuration $q = 3$, the line intensity ratio

$$I(^2D_{5/2} - {}^4S_{3/2})/I(^2D_{3/2} - {}^4S_{3/2})$$

shows strong density dependence for the following reason: if an ion has two energy levels close to each other, then the ratio of the excitation rates is simply a ratio of the collision strengths. If the radiative transition probabilities or the collisional de-excitation rates are different, then the ratio of the relative populations of these two levels will depend on the density, and thus the ratio of the line intensities depends on the density. (See Osterbrock 1974.) Both $^2D - {}^4S$ lines are provided in the tables.

For ions with ground state configuration $q = 2, 4$, the line intensity ratio

$$\left\{\sum_{J=0}^{2} I(^1D_2 - {}^3P_J)\right\}\Big/ I(^1S_0 - {}^1D_2)$$

shows temperature dependence for the following reason: the energy difference between the $^1S_0$ and $^1D_2$ levels is large enough so that the relative populations will depend on temperature, as will the ratio of the line intensities arising from these two levels.

In the present work, two line intensities for the $^1D - {}^3P$ transitions are shown in addition to the line intensity for the $^1S - {}^1D$ transition. The $^1D_2 - {}^3P_0$ transition is neglected because of the relatively weaker transition probability. For ions with ground state configuration $q = 1, 5$, the single transition line intensity is given. An extra table for the strongest line other than the transitions mentioned above in the range 912–3200 Å for each ion with configuration $n = 2, 3$ and $q = 2, 3, 4$ is also given, if available. If two strong lines of the same ion are within a few angstroms we included both in separate tables. Where the previous work provided information for the temperature range where the ion is most abundant (above 5% relative ionic abundance), in the current work we have provided the same temperature limits, and, if the temperature range is near $10^4$ K and was not provided before, we have extended the temperature range to include this data point in the tables (e.g., for ions up to and including C II, N III, O IV, Ne VI, Mg V, Si II, and S IV).

In Figures 1–25 we show some of the tabulated data in graphical form: N II (λ6583.6), Figure 1; O I (λ6300.23), 2; O II (λ3728.91), 3; O II (λ3726.16), 4; O III (λ5006.84), 5; Ne III (λ3868.74), 6; S II (λ6730.78), 7; S II (λ6716.42), 8; S III (λ9532.1), 9; O II (λ2470.4 + λ2470.3), 10; O III (λ2321.1), 11; Ne III (λ3342.9), 12; Ne III (λ1814.8), 13; Ne IV (λ1608.8 + λ1609.0), 14; Ne V (λ2972.0), 15; Ne V (1575.2), 16; Mg V (λ2750.4), 17; Mg V (λ2416.8), 18; Mg V (λ1317.0), 19; C II (λ$1.56 \times 10^6$), 20; N III (λ$5.729 \times 10^5$), 21; O IV (λ$2.587 \times 10^5$), 22; Ne II (λ$1.278 \times 10^5$), 23; Ne VI (λ76320.0), 24; Si II (λ$3.4795 \times 10^5$), 25.

The line intensities presented in Figures 1–25 were chosen from the data for graphical representation because they showed either a strong temperature or density dependence. We graphed the logarithm of the term $I_{ji}/n^2N_{A,Z}$ versus either logarithm of density or logarithm of temperature, the criteria being whether this term showed a greater variation with density or temperature. If this term was graphed versus the logarithm of density, graphs for several temperatures are given on the same graph corresponding to all points available in the accompanying table. Likewise, if this term was graphed versus the logarithm of temperature, graphs for several densities are given on the same graph corresponding to all points available in the table. The range of the logarithm of density is from 0 ($n = 1$ cm$^{-3}$) to 10 ($n = 10^{10}$ cm$^{-3}$). The range of the logarithm of temperature corresponds to the temperature range where the ionic abundance is greater than 5% and, in some cases, extends through $10^4$ K as discussed earlier. If two lines of the same ion are within an angstrom, we graphed the logarithm of the term $(\sum I)/n^2N_{A,Z}$ versus either logarithm of density or logarithm of temperature for all densities and temperatures available in the corresponding tables.

The tables of data and figures presented here may be used to calculate the absolute line intensities if the relative ionic abundance $N_{A,Z}$ is known as well as the desired path length $L$. For both tables and figures, the units of the line intensity $I$ are log ergs cm$^{-2}$ s$^{-1}$ sr$^{-1}$. We have normalized the results for $L = 3.085 \times 10^{18}$ cm (1 pc). For different path lengths these results should be multiplied by $L_{pc}$, the path length in pc. If the line flux at the Earth is desired, the above results should be multiplied by the solid angle Ω. Furthermore, extrapolation to different densities or temperatures outside the given range can be carried out if desired, using the tabulated values. A specific sample calculation is presented in Appendix A. Our computa-

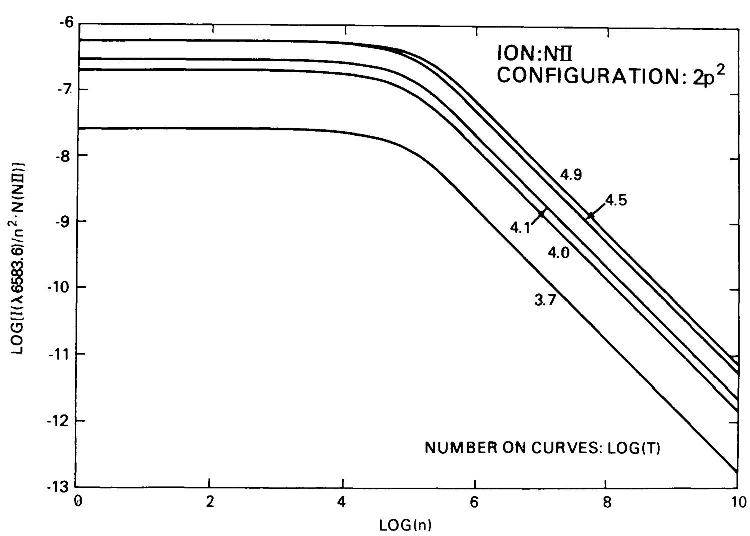


FIG. 1

FIGS. 1–25.—Graphs of the term $I_{ji}/n^2N_{A,Z}$ vs. temperature and density (see text) are provided here for some interesting cases which show strong temperature or density dependence. The figures are not in the same relative order as the tables, but are grouped into three sections: strong density dependence (Figs. 1–9); strong temperature dependence (Figs. 10–19); and ions with $q = 1, 5$, which show strong density dependence (Figs. 20–25). The results can be scaled to path lengths $L_{pc}$ by multiplying by $L_{pc}$ and can be converted to line fluxes at the Earth (ergs cm$^{-2}$ s$^{-1}$) by multiplying by the solid angle of the ionized region Ω (see text).

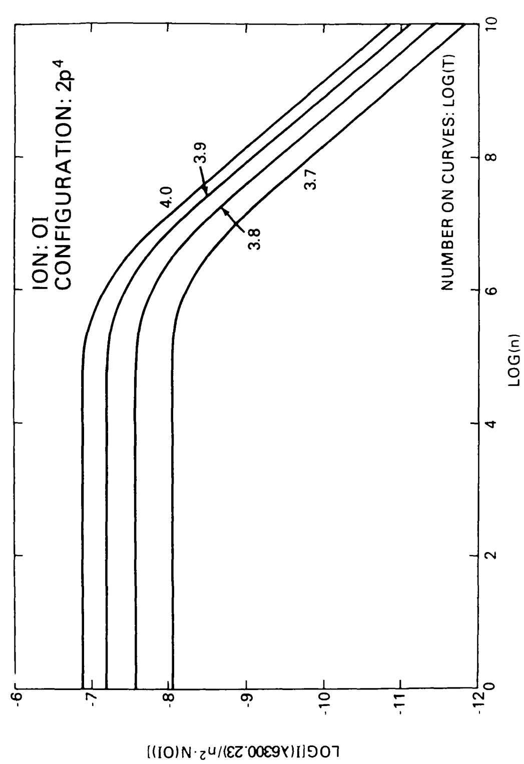


FIG. 2

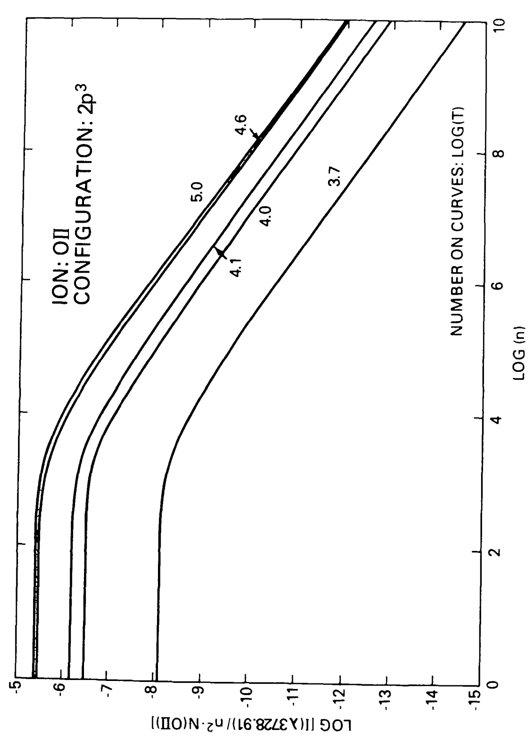


FIG. 3

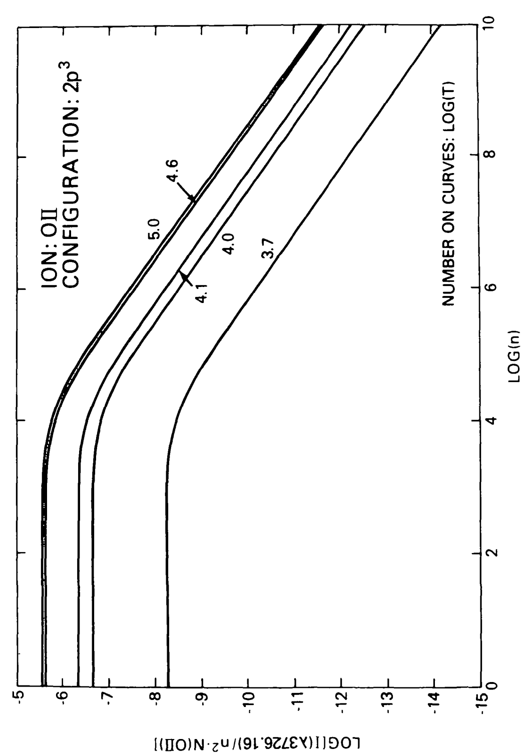


FIG. 4

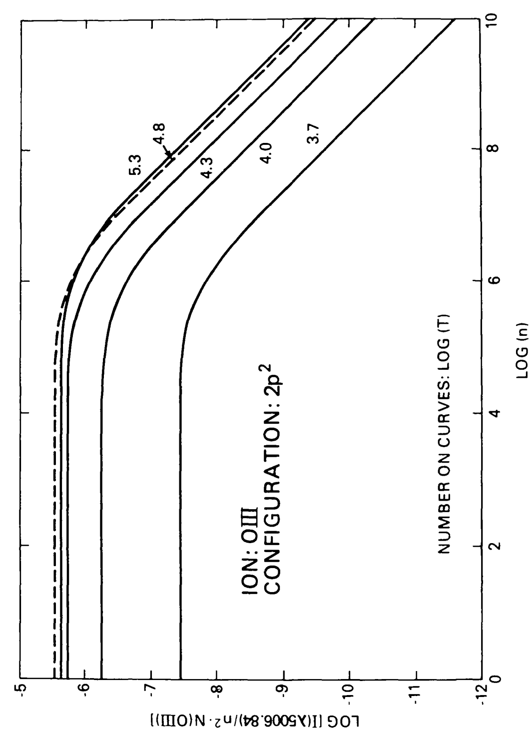


FIG. 5

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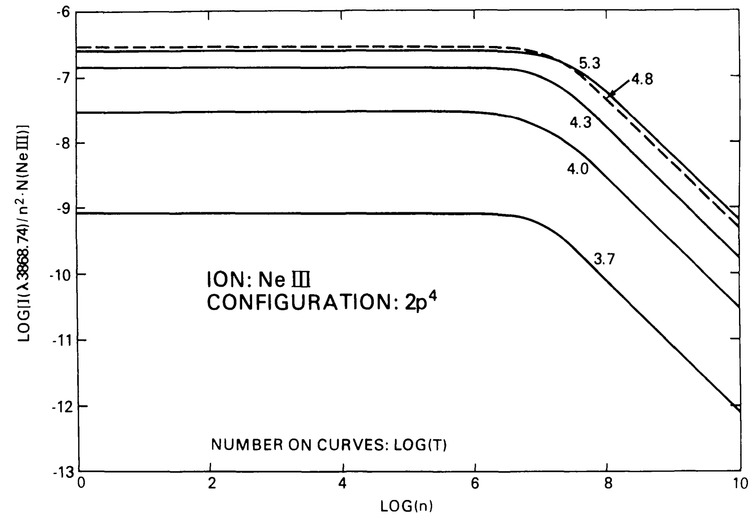


FIG. 6

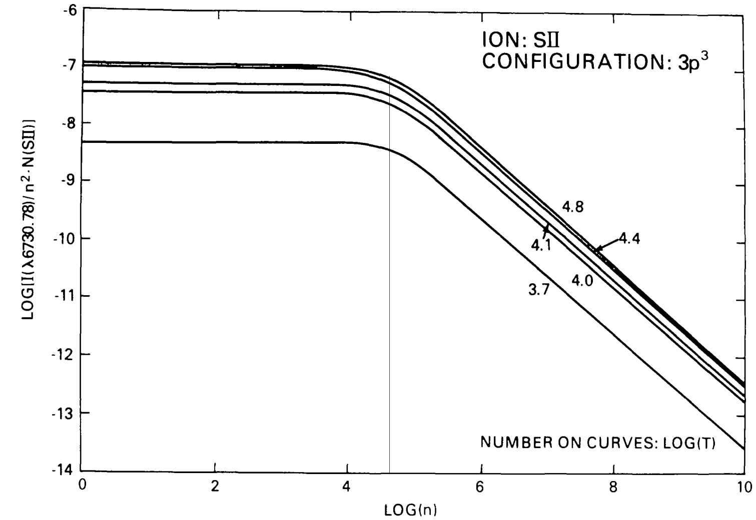


FIG. 7

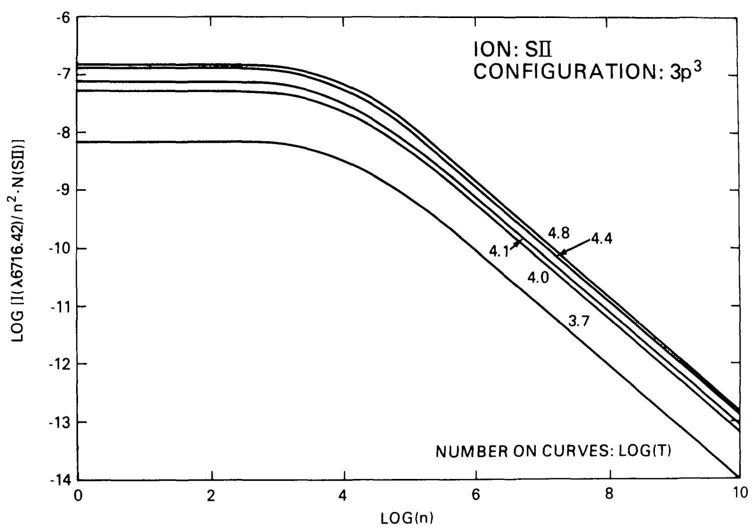


FIG. 8

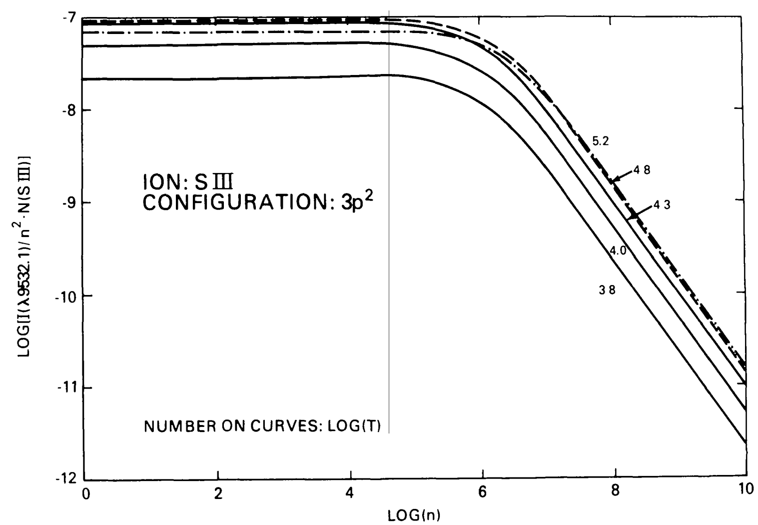


FIG. 9

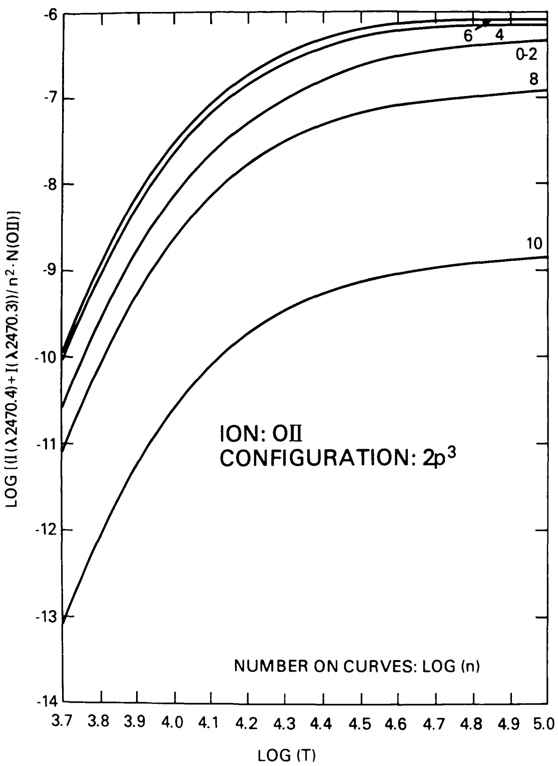


FIG. 10

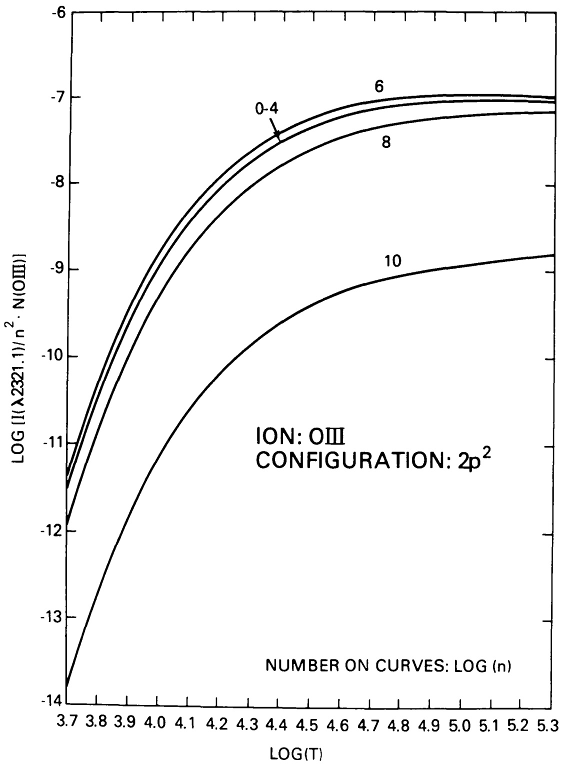


FIG. 11

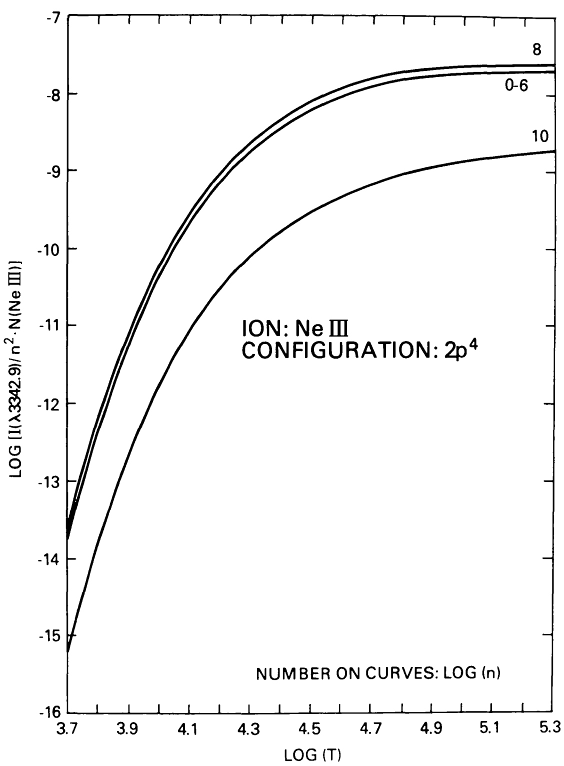


FIG. 12

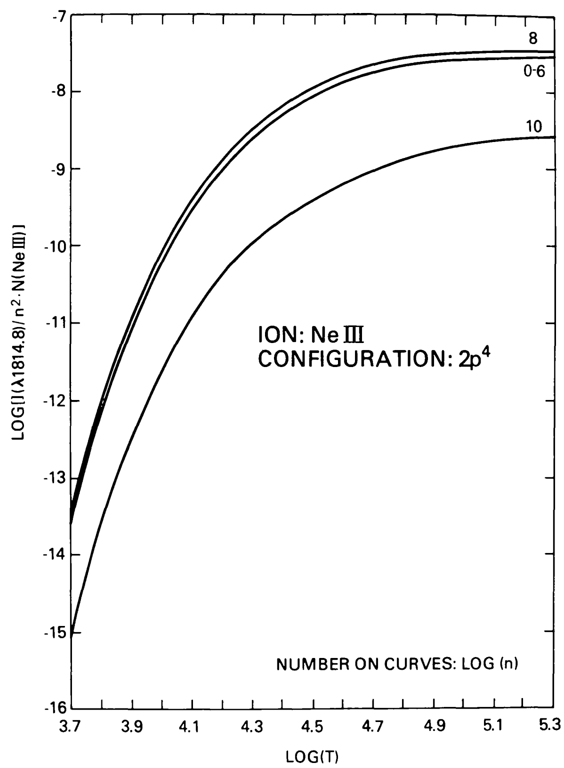


FIG. 13

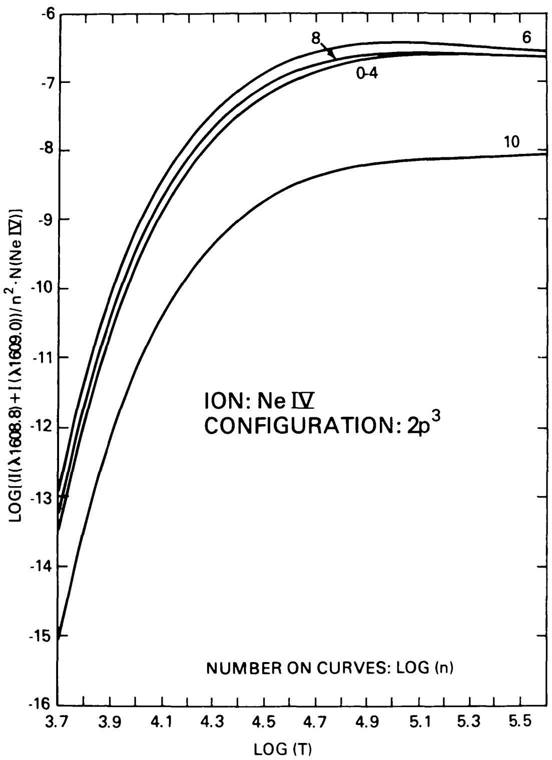


FIG. 14

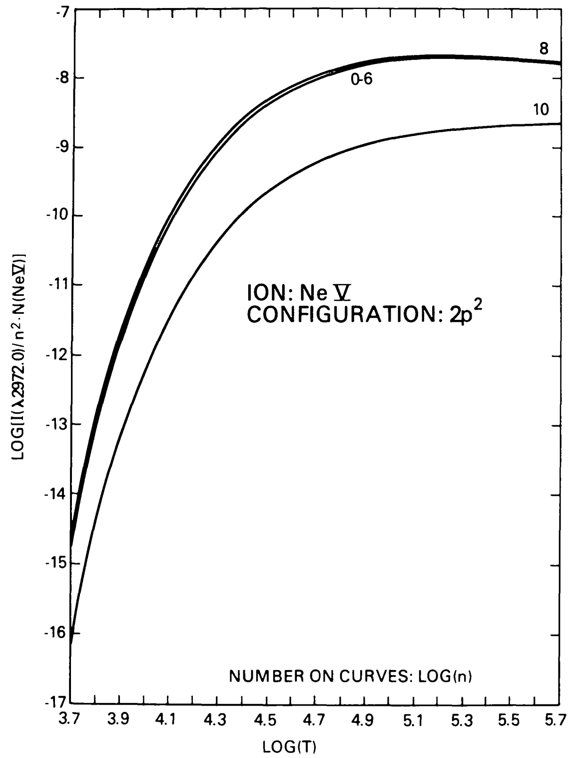


FIG. 15

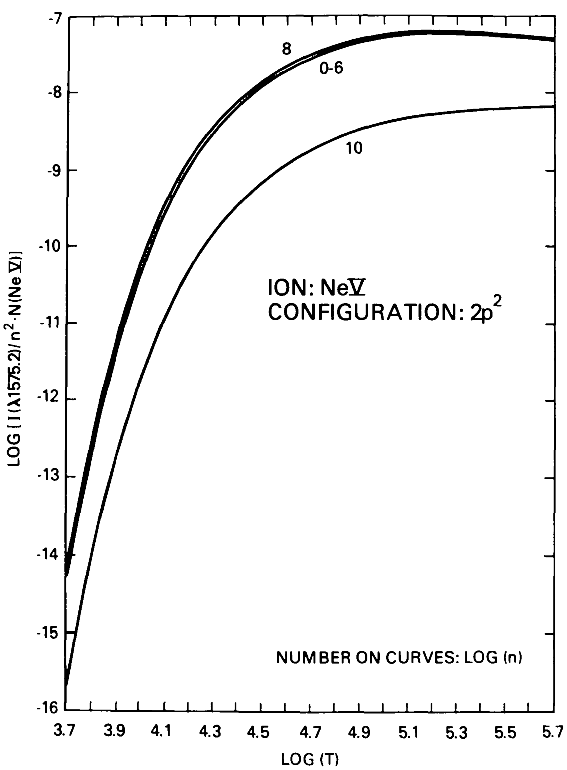


FIG. 16

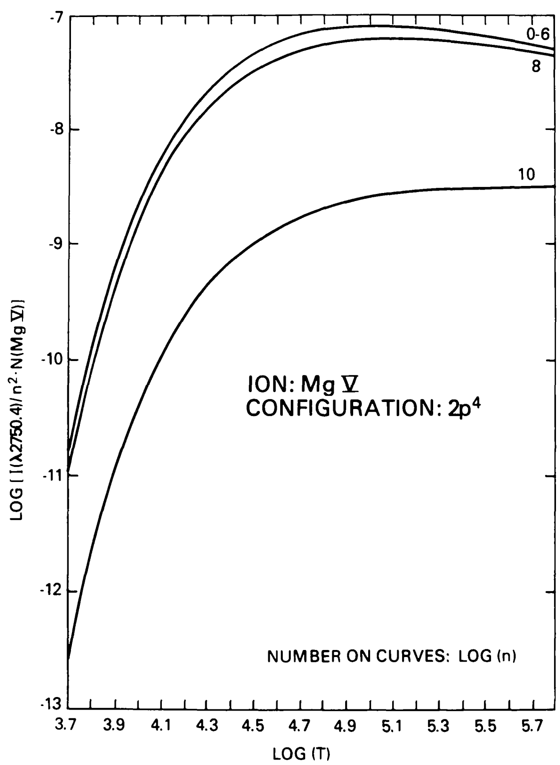


FIG. 17

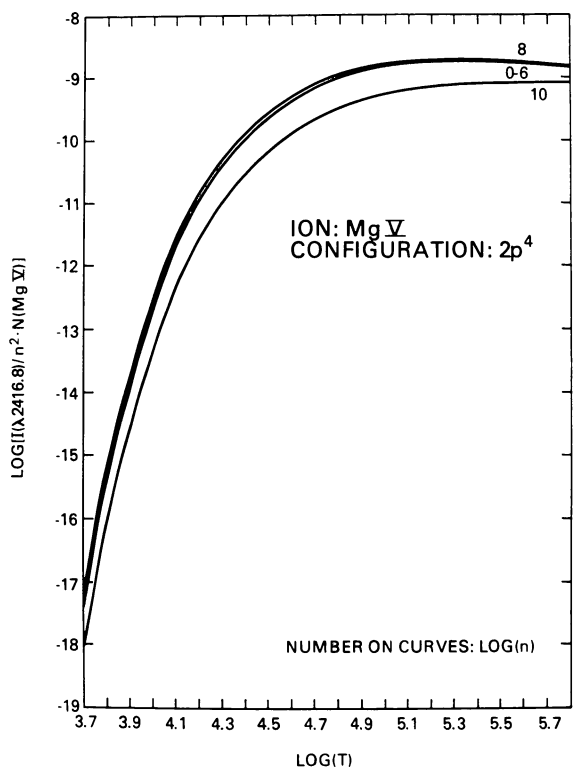


FIG. 18

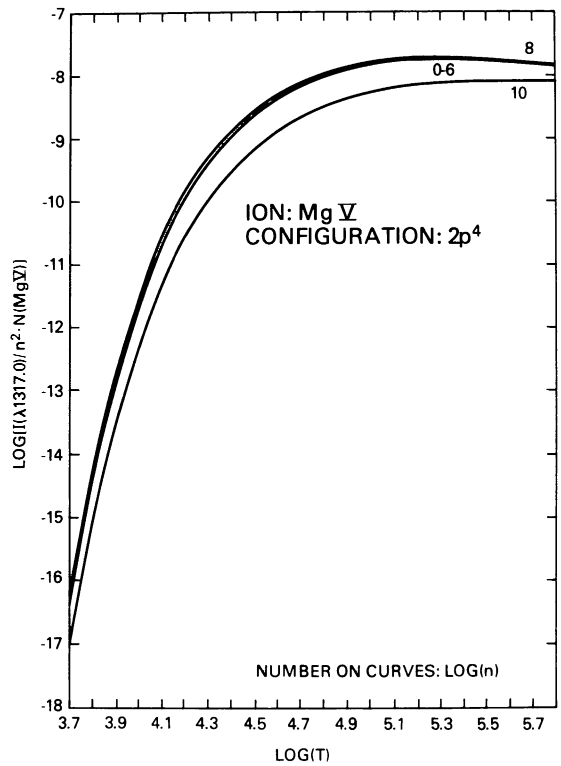


FIG. 19

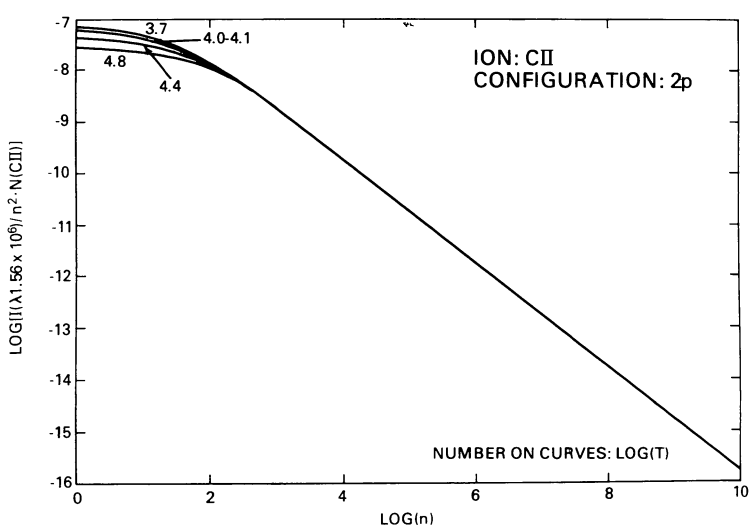


FIG. 20

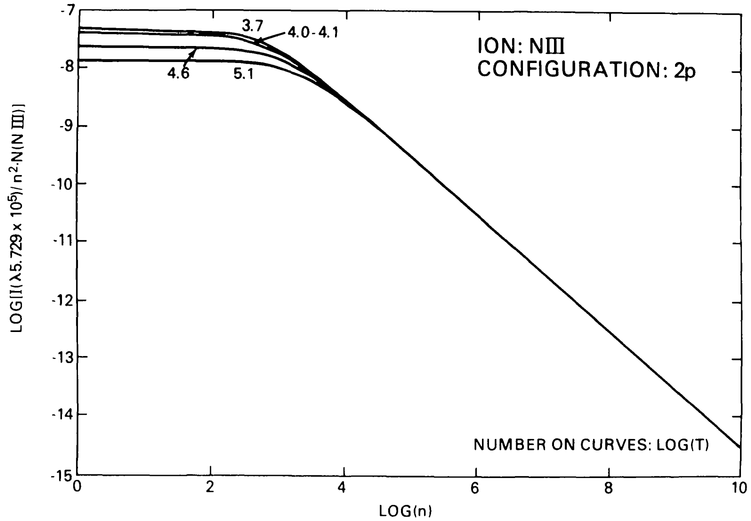


FIG. 21

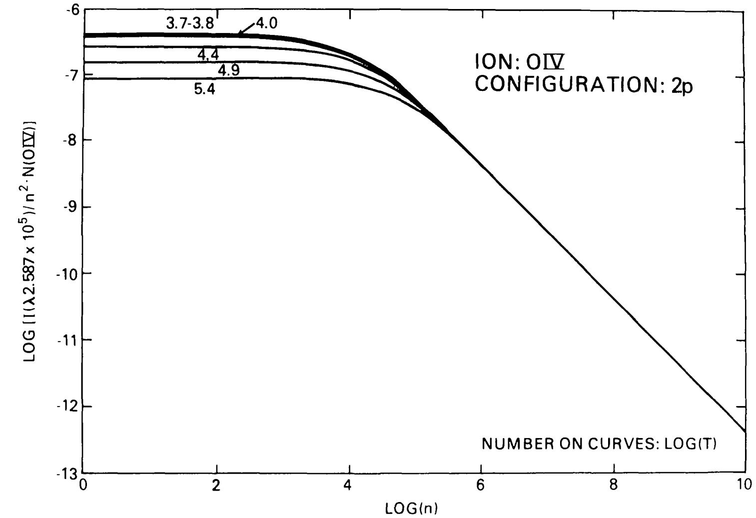


FIG. 22

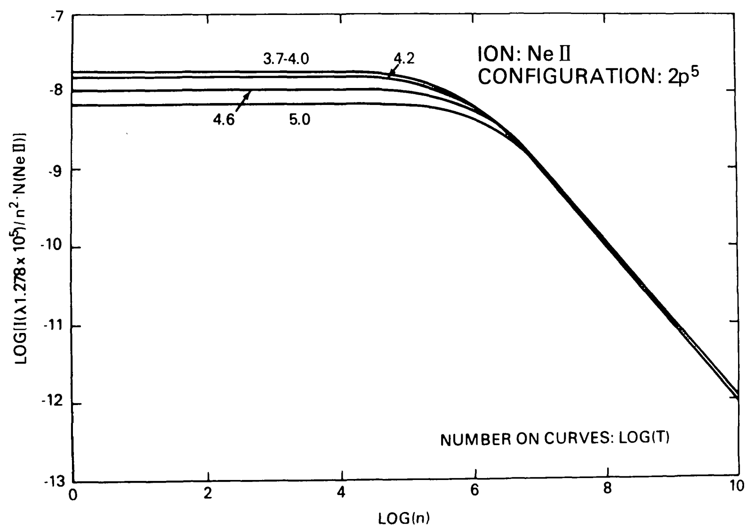


FIG. 23

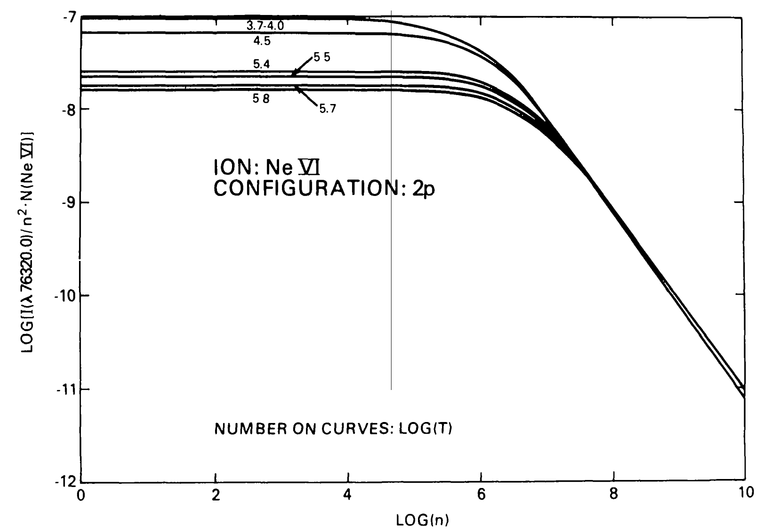


FIG. 24

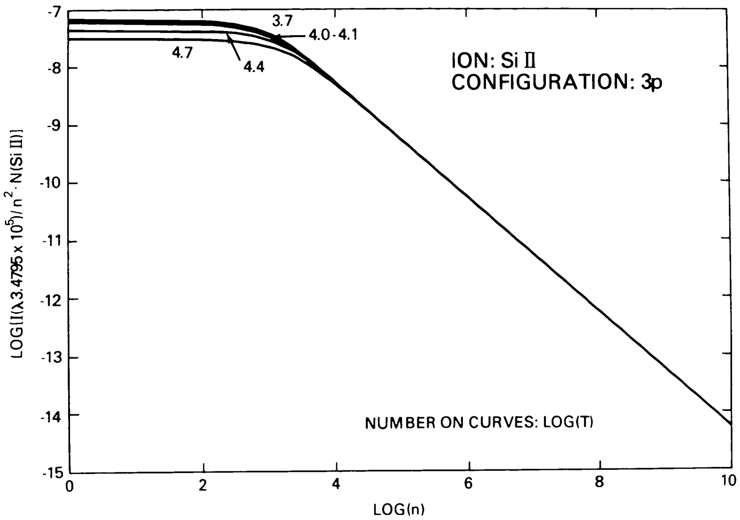


FIG. 25

tions can be used for diagnostic purposes to determine the temperatures and densities of hot cosmic plasmas in the temperature range $5 \times 10^3$–$2 \times 10^6$ K. Even though radiative cooling is very strong in this range, little information on the forbidden line emission from cosmic gases for temperatures above $10^5$ K exists, although the O VI observations indicate that a sizable portion of the interstellar medium is in this hot state.

It is hoped that the results presented here will be useful to researchers in the UV, visible, and IR fields. If different calculations are desired, they can be easily obtained from the data provided here and in the previous work (Paper I).

## APPENDIX A
## SAMPLE CALCULATION FOR FORBIDDEN LINE INTENSITIES

Example: O III (λ5006.84), Configuration $2p^2$, Transition $^1D_2 - {}^3P_2$.

$$\text{Intensity } I_{ji} = A_{ji} N_j N_{A,Z} N_A h\nu_{ji} \frac{n}{1 + N_{\rm He}} \frac{L}{4\pi} \text{ ergs cm}^{-2}\text{ s}^{-1}\text{ sr}^{-1} ,$$

where $A_{ji}$ is the radiative transition probability from upper level $j$ to lower level $i$, $N_j$ is the relative population of level $j$, $N_{A,Z}$ is the relative ionic abundance of ion with charge $Z$ of element with atomic number $A$, $N_A$ is the relative chemical abundance (with respect to hydrogen), $\nu_{ji}$ is the frequency of transition ($= c/\lambda_{ji}$ where $\lambda_{ji}$ is the wavelength of transition), $n$ is the total number density of hydrogen and helium nuclei (in $\text{cm}^{-3}$), $N_{\rm He}$ is the relative chemical abundance of helium, and $L$ is the path length through the line emitting region. The relative population of the level ($N_j$) is a function of temperature and density only.

For the transition $^1D_2 - {}^3P_2$, $j = 4$ and $i = 3$. Then, for temperature $T = 10^{4.3}$ K and density $n = 10^6\text{ cm}^{-3}$, we have

$$A_{43} = 0.021\text{ s}^{-1} ,$$

$$N_4 = 6.538349375 \times 10^{-2} ,$$

$$N_{A,Z}(O^{++}) = 3.718 \times 10^{-1} ,$$

$$N_A(O) = 6.76 \times 10^{-4} ,$$

$$h = 6.626196 \times 10^{-27}\text{ ergs s} ,$$

$$\nu_{43} = \frac{c}{\lambda_{43}} : c = 2.99792458 \times 10^{10}\text{ cm s}^{-1} ,$$

$$\lambda_{43} = 5006.84 \times 10^{-8}\text{ cm} ,$$

$$n = 10^6\text{ cm}^{-3} ,$$

$$N_{He} = 0.0695 ,$$

$$L = 1 \text{ pc} = 3.085678 \times 10^{18} \text{ cm} ,$$

and

$$I_{43} = (0.021 \text{ s}^{-1})(6.538349375 \times 10^{-2})(3.718 \times 10^{-1})(6.76 \times 10^{-4})(6.626196 \times 10^{-27} \text{ ergs s})$$

$$\times \frac{(2.99792458 \times 10^{10} \text{ cm s}^{-1})}{5006.84 \times 10^{-8} \text{ cm}} \times \left(\frac{10^6 \text{ cm}^{-3}}{1 + 0.0695}\right)\left(\frac{3.085678 \times 10^{18} \text{ cm}}{4\pi \text{ sr}}\right) = 3.1435814 \times 10^5 \text{ ergs cm}^{-2} \text{ s}^{-1} \text{ sr}^{-1} .$$

Then,

$$\frac{I_{ji}}{n^2 N_{A,Z}} = \frac{3.1435814 \times 10^5 \text{ ergs cm}^{-2} \text{ s}^{-1} \text{ sr}^{-1}}{(10^6 \text{ cm}^{-3})^2 (3.718 \times 10^{-1})} = 8.4550333 \times 10^{-7} \text{ ergs cm}^4 \text{ s}^{-1} \text{ sr}^{-1}$$

and

$$-\log\left\{\frac{I_{ji}}{n^2 N_{A,Z}}\right\} = 6.0728846 .$$

## APPENDIX B

The terms $I_{ji}/n^2N_{A,Z}$ are given for different temperatures and densities. The tables are ordered from N I through Fe XIII (the $q = 2$, 3, 4 ions), Tables 1–22; and from C II through Fe XIV (the $q = 1$, 5 ions), Tables 23–37. The letter designations on the tables refer to individual transitions for that ion.

The temperature range was chosen so that the relative ionic abundances in the time-dependent cooling case (see text) were above ~5%. These temperature ranges should be adequate for most purposes. Extrapolations to temperatures outside the given range can be carried out if desired. The results are presented as a function of the density $n$ rather than $n_e$, the density being the parameter which does not change even if the gas recombines. Below $T \approx 10^4$ K, the results are strictly correct for a gas that is cooling radiatively, although the results should roughly be applicable to cases where there is no time variation of $n_e$ (like H II regions). The units of $I_{ji}$ are ergs cm$^{-2}$ s$^{-1}$ sr$^{-1}$ and normalized to $L = 3.085 \times 10^{18}$ cm (1 pc).

TABLE 1A

ION N I — CONFIGURATION $2p^3$
TRANSITION $^2D_{5/2}$–$^4S_{3/2}$ — WAVELENGTH (Å) 5200.7

−log (INTENSITY/$n^2N$ (N I))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 4.1 ...... | 7.1682 | 7.1969 | 8.0491 | 9.9908 | 12.0447 | 14.0498 |
| 4.0 ...... | 7.4615 | 7.4853 | 8.2716 | 10.1976 | 12.2370 | 14.2412 |
| 3.9 ...... | 7.8328 | 7.8525 | 8.5756 | 10.4855 | 12.5115 | 14.5149 |
| 3.8 ...... | 8.2962 | 8.3125 | 8.9736 | 10.8664 | 12.8814 | 14.8839 |
| 3.7 ...... | 8.8721 | 8.8855 | 9.4827 | 11.3557 | 13.3623 | 15.3640 |

NOTE.—The density $n = n_H + n_{He}$ (cm$^{-3}$). Intensity in units of ergs cm$^{-2}$ s$^{-1}$ sr$^{-1}$ (1 pc path length).

TABLE 2A

ION N II — CONFIGURATION $2p^2$
TRANSITION $^1D_2$–$^3P_1$ — WAVELENGTH (Å) 6548.1

−log (INTENSITY/$n^2N$ (N II))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 4.9 ...... | 6.7127 | 6.7128 | 6.7430 | 7.6363 | 9.6080 | 11.6198 |
| 4.5 ...... | 6.7093 | 6.7088 | 6.7502 | 7.7620 | 9.7397 | 11.7448 |
| 4.1 ...... | 6.9969 | 6.9949 | 7.0472 | 8.1506 | 10.1248 | 12.1256 |
| 4.0 ...... | 7.1571 | 7.1546 | 7.2091 | 8.3300 | 10.3035 | 12.3038 |
| 3.7 ...... | 8.0533 | 8.0474 | 8.1041 | 9.2512 | 11.2240 | 13.2237 |

TABLE 1B

ION N I — CONFIGURATION $2p^3$
TRANSITION $^2D_{3/2}$–$^4S_{3/2}$ — WAVELENGTH (Å) 5198.5

−log (INTENSITY/$n^2N$ (N I))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 4.1 ...... | 7.3415 | 7.3523 | 7.9356 | 9.8247 | 11.8589 | 13.8609 |
| 4.0 ...... | 7.6356 | 7.6441 | 8.1630 | 10.0269 | 12.0509 | 14.0525 |
| 3.9 ...... | 8.0078 | 8.0148 | 8.4743 | 10.3098 | 12.3250 | 14.3262 |
| 3.8 ...... | 8.4722 | 8.4780 | 8.8829 | 10.6864 | 12.6946 | 14.6955 |
| 3.7 ...... | 9.0490 | 9.0539 | 9.4062 | 11.1723 | 13.1753 | 15.1758 |

TABLE 2B

ION N II — CONFIGURATION $2p^2$
TRANSITION $^1D_2$–$^3P_2$ — WAVELENGTH (Å) 6583.6

−log (INTENSITY/$n^2N$ (N II))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 4.9 ...... | 6.2507 | 6.2509 | 6.2812 | 7.1742 | 9.1460 | 11.1580 |
| 4.5 ...... | 6.2473 | 6.2468 | 6.2884 | 7.3000 | 9.2777 | 11.2827 |
| 4.1 ...... | 6.5351 | 6.5331 | 6.5854 | 7.6886 | 9.6627 | 11.6636 |
| 4.0 ...... | 6.6952 | 6.6927 | 6.7471 | 7.8680 | 9.8415 | 11.8418 |
| 3.7 ...... | 7.5914 | 7.5853 | 7.6423 | 8.7894 | 10.7622 | 12.7618 |

TABLE 2C

ION N II — CONFIGURATION $2p^2$
TRANSITION $^1S_0$–$^1D_2$ — WAVELENGTH (Å) 5754.8

−log (INTENSITY/$n^2N$ (N II))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 4.9 ...... | 7.2092 | 7.2088 | 7.1939 | 7.0594 | 7.5404 | 9.3807 |
| 4.5 ...... | 7.4004 | 7.3991 | 7.3724 | 7.2071 | 7.8217 | 9.7112 |
| 4.1 ...... | 8.1920 | 8.1889 | 8.1430 | 7.9398 | 8.6871 | 10.6097 |
| 4.0 ...... | 8.5700 | 8.5663 | 8.5152 | 8.3050 | 9.0800 | 11.0080 |
| 3.7 ...... | 10.5393 | 10.5319 | 10.4709 | 10.2498 | 11.0685 | 13.0044 |

TABLE 2D

ION N II — CONFIGURATION $2p^2$
TRANSITION $^1S_0$–$^3P_1$ — WAVELENGTH (Å) 3063.0

−log (INTENSITY/$n^2N$ (N II))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 4.9 ...... | 8.4373 | 8.4368 | 8.4221 | 8.2874 | 8.7685 | 10.6088 |
| 4.5 ...... | 8.6283 | 8.6271 | 8.6005 | 8.4352 | 9.0497 | 10.9392 |
| 4.1 ...... | 9.4201 | 9.4169 | 9.3711 | 9.1679 | 9.9151 | 11.8376 |
| 4.0 ...... | 9.7981 | 9.7942 | 9.7433 | 9.5330 | 10.3081 | 12.2360 |
| 3.7 ...... | 11.7671 | 11.7599 | 11.6989 | 11.4778 | 12.2966 | 14.2324 |

TABLE 3A

ION O I — CONFIGURATION $2p^4$
TRANSITION $^1D_2$–$^3P_2$ — WAVELENGTH (Å) 6300.23

−log (INTENSITY/$n^2N$ (O I))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 4.0 ...... | 6.8888 | 6.8889 | 6.8920 | 7.1741 | 8.8671 | 10.8657 |
| 3.9 ...... | 7.1930 | 7.1930 | 7.1954 | 7.4509 | 9.1137 | 11.1101 |
| 3.8 ...... | 7.5765 | 7.5765 | 7.5782 | 7.8039 | 9.4291 | 11.4238 |
| 3.7 ...... | 8.0570 | 8.0570 | 8.0580 | 8.2515 | 9.8292 | 11.8223 |

TABLE 3B

ION O I — CONFIGURATION $2p^4$
TRANSITION $^1D_2$–$^3P_1$ — WAVELENGTH (Å) 6363.88

−log (INTENSITY/$n^2N$ (O I))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 4.0 ...... | 7.3860 | 7.3860 | 7.3892 | 7.6712 | 9.3643 | 11.3629 |
| 3.9 ...... | 7.6900 | 7.6900 | 7.6925 | 7.9479 | 9.6107 | 11.6072 |
| 3.8 ...... | 8.0735 | 8.0736 | 8.0753 | 8.3010 | 9.9261 | 11.9209 |
| 3.7 ...... | 8.5541 | 8.5541 | 8.5551 | 8.7484 | 10.3263 | 12.3193 |

TABLE 3C

ION O I — CONFIGURATION $2p^4$
TRANSITION $^1S_0$–$^1D_2$ — WAVELENGTH (Å) 5577.35

−log (INTENSITY/$n^2N$ (O I))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 4.0 ...... | 8.6361 | 8.6360 | 8.6327 | 8.5232 | 8.6338 | 10.2150 |
| 3.9 ...... | 9.2450 | 9.2450 | 9.2418 | 9.1363 | 9.2145 | 10.7505 |
| 3.8 ...... | 10.0146 | 10.0143 | 10.0112 | 9.9145 | 9.9581 | 11.4301 |
| 3.7 ...... | 10.9836 | 10.9834 | 10.9805 | 10.8973 | 10.9065 | 12.2889 |

TABLE 3D

ION O I — CONFIGURATION $2p^4$
TRANSITION $^1S_0$–$^3P_1$ — WAVELENGTH (Å) 2972.3

−log (INTENSITY/$n^2N$ (O I))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 4.0 ...... | 9.6638 | 9.6637 | 9.6604 | 9.5509 | 9.6615 | 11.2427 |
| 3.9 ...... | 10.2727 | 10.2727 | 10.2694 | 10.1640 | 10.2423 | 11.7783 |
| 3.8 ...... | 11.0422 | 11.0422 | 11.0390 | 10.9423 | 10.9858 | 12.4578 |
| 3.7 ...... | 12.0112 | 12.0112 | 12.0082 | 11.9250 | 11.9342 | 13.3166 |

TABLE 4A

ION O II — CONFIGURATION $2p^3$
TRANSITION $^2D_{5/2}$–$^4S_{3/2}$ — WAVELENGTH (Å) 3728.91

−log (INTENSITY/$n^2N$ (O II))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 5.0 ...... | 5.3851 | 5.3983 | 5.9842 | 7.8419 | 9.9252 | 11.9415 |
| 4.6 ...... | 5.4569 | 5.4733 | 6.0984 | 7.9506 | 9.9999 | 12.0066 |
| 4.1 ...... | 6.1683 | 6.1872 | 6.7969 | 8.6092 | 10.6078 | 12.6078 |
| 4.0 ...... | 6.4782 | 6.4977 | 7.1108 | 8.9221 | 10.9187 | 12.9185 |
| 3.7 ...... | 8.0944 | 8.1153 | 8.7421 | 10.5588 | 12.5559 | 14.5559 |

TABLE 4B

ION O II — CONFIGURATION $2p^3$
TRANSITION $^2D_{3/2}$–$^4S_{3/2}$ — WAVELENGTH (Å) 3726.16

−log (INTENSITY/$n^2N$ (O II))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 5.0 ...... | 5.5474 | 5.5485 | 5.7739 | 7.4541 | 9.5492 | 11.5682 |
| 4.6 ...... | 5.6224 | 5.6211 | 5.8482 | 7.5664 | 9.6254 | 11.6334 |
| 4.1 ...... | 6.3412 | 6.3338 | 6.5179 | 8.2333 | 10.2351 | 12.2355 |
| 4.0 ...... | 6.6526 | 6.6445 | 6.8289 | 8.5479 | 10.5463 | 12.5463 |
| 3.7 ...... | 8.2724 | 8.2632 | 8.4579 | 10.1884 | 12.1849 | 14.1849 |

TABLE 4C

Ion O II — Configuration $2p^3$
Transition $^2P_{3/2}$–$^4S_{3/2}$ — Wavelength (Å) 2470.4

−log (Intensity/$n^2N$ (O II))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 5.0 ...... | 6.4360 | 6.4285 | 6.2474 | 6.1895 | 6.9958 | 8.9279 |
| 4.6 ...... | 6.6191 | 6.6043 | 6.3177 | 6.2417 | 7.1698 | 9.1211 |
| 4.1 ...... | 7.7589 | 7.7302 | 7.2675 | 7.1537 | 8.2190 | 10.1856 |
| 4.0 ...... | 8.2354 | 8.2044 | 7.7209 | 7.6080 | 8.7003 | 10.6692 |
| 3.7 ...... | 10.6869 | 10.6522 | 10.1466 | 10.0425 | 11.1802 | 13.1528 |

TABLE 4D

Ion O II — Configuration $2p^3$
Transition $^2P_{1/2}$–$^4S_{3/2}$ — Wavelength (Å) 2470.3

−log (Intensity/$n^2N$ (O II))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 5.0 ...... | 7.0309 | 7.0247 | 6.8543 | 6.7917 | 7.6860 | 9.6304 |
| 4.6 ...... | 7.2140 | 7.2014 | 6.9228 | 6.8480 | 7.8643 | 9.8237 |
| 4.1 ...... | 8.3538 | 8.3283 | 7.8711 | 7.7676 | 8.9168 | 10.8881 |
| 4.0 ...... | 8.8304 | 8.8028 | 8.3244 | 8.2233 | 9.3984 | 11.3717 |
| 3.7 ...... | 11.2817 | 11.2509 | 10.7499 | 10.6605 | 11.8789 | 13.8554 |

TABLE 5A

Ion O III — Configuration $2p^2$
Transition $^1D_2$–$^3P_1$ — Wavelength (Å) 4958.91

−log (Intensity/$n^2N$ (O III))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 5.3 ...... | 6.0873 | 6.0873 | 6.0892 | 6.2746 | 7.8474 | 9.8665 |
| 4.8 ...... | 5.9879 | 5.9878 | 5.9899 | 6.2557 | 7.9437 | 9.9527 |
| 4.3 ...... | 6.1968 | 6.1963 | 6.1967 | 6.5397 | 8.2922 | 10.2918 |
| 4.0 ...... | 6.7101 | 6.7089 | 6.7052 | 7.0939 | 8.8753 | 10.8729 |
| 3.7 ...... | 7.9119 | 7.9093 | 7.8963 | 8.3098 | 10.1064 | 12.1038 |

TABLE 5B

Ion O III — Configuration $2p^2$
Transition $^1D_2$–$^3P_2$ — Wavelength (Å) 5006.84

−log (Intensity/$n^2N$ (O III))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 5.3 ...... | 5.6205 | 5.6205 | 5.6225 | 5.8077 | 7.3805 | 9.3999 |
| 4.8 ...... | 5.5210 | 5.5210 | 5.5232 | 5.7889 | 7.4770 | 9.4859 |
| 4.3 ...... | 5.7301 | 5.7296 | 5.7298 | 6.0731 | 7.8255 | 9.8250 |
| 4.0 ...... | 6.2435 | 6.2420 | 6.2384 | 6.6272 | 8.4085 | 10.4060 |
| 3.7 ...... | 7.4453 | 7.4424 | 7.4296 | 7.8430 | 9.6397 | 11.6370 |

TABLE 5C

Ion O III — Configuration $2p^2$
Transition $^1S_0$–$^1D_2$ — Wavelength (Å) 4363.21

−log (Intensity/$n^2N$ (O III))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 5.3 ...... | 6.4637 | 6.4634 | 6.4598 | 6.4178 | 6.5914 | 8.2349 |
| 4.8 ...... | 6.5066 | 6.5060 | 6.5005 | 6.4265 | 6.7133 | 8.4728 |
| 4.3 ...... | 7.1833 | 7.1822 | 7.1713 | 7.0395 | 7.4564 | 9.2985 |
| 4.0 ...... | 8.4001 | 8.3980 | 8.3804 | 8.2154 | 8.7158 | 10.5908 |
| 3.7 ...... | 11.0200 | 11.0162 | 10.9881 | 10.8094 | 11.3533 | 13.2414 |

TABLE 5D

Ion O III — Configuration $2p^2$
Transition $^1S_0$–$^3P_1$ — Wavelength (Å) 2321.1

−log (Intensity/$n^2N$ (O III))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 5.3 ...... | 7.0319 | 7.0316 | 7.0280 | 6.9860 | 7.1596 | 8.8031 |
| 4.8 ...... | 7.0747 | 7.0743 | 7.0687 | 6.9948 | 7.2815 | 9.0411 |
| 4.3 ...... | 7.7516 | 7.7504 | 7.7395 | 7.6078 | 8.0248 | 9.8668 |
| 4.0 ...... | 8.9685 | 8.9663 | 8.9489 | 8.7837 | 9.2840 | 11.1590 |
| 3.7 ...... | 11.5882 | 11.5844 | 11.5563 | 11.3778 | 11.9215 | 13.8097 |

TABLE 6A

Ion Ne III — Configuration $2p^4$
Transition $^1D_2$–$^3P_2$ — Wavelength (Å) 3868.74

−log (Intensity/$n^2N$ (Ne III))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 5.3 ...... | 6.6043 | 6.6043 | 6.6043 | 6.6192 | 7.2711 | 9.1854 |
| 4.8 ...... | 6.5391 | 6.5391 | 6.5393 | 6.5611 | 7.3610 | 9.2996 |
| 4.3 ...... | 6.8583 | 6.8583 | 6.8581 | 6.8842 | 7.8035 | 9.7536 |
| 4.0 ...... | 7.5396 | 7.5396 | 7.5388 | 7.5646 | 8.5567 | 10.5150 |
| 3.7 ...... | 9.0849 | 9.0849 | 9.0824 | 9.0986 | 10.1297 | 12.0922 |

TABLE 6B

Ion Ne III — Configuration $2p^4$
Transition $^1D_2$–$^3P_1$ — Wavelength (Å) 3967.51

−log (Intensity/$n^2N$ (Ne III))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 5.3 ...... | 7.1296 | 7.1296 | 7.1297 | 7.1445 | 7.7965 | 9.7108 |
| 4.8 ...... | 7.0644 | 7.0644 | 7.0645 | 7.0863 | 7.8863 | 9.8250 |
| 4.3 ...... | 7.3838 | 7.3838 | 7.3834 | 7.4095 | 8.3288 | 10.2790 |
| 4.0 ...... | 8.0651 | 8.0651 | 8.0640 | 8.0899 | 9.0820 | 11.0404 |
| 3.7 ...... | 9.6104 | 9.6103 | 9.6078 | 9.6241 | 10.6549 | 12.6176 |

TABLE 6C

ION Ne III CONFIGURATION $2p^4$
TRANSITION $^1S_0$–$^1D_2$ WAVELENGTH (Å) 3342.9

−log (INTENSITY/$n^2N$ (Ne III))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 5.3 ...... | 7.6848 | 7.6848 | 7.6845 | 7.6773 | 7.6083 | 8.7258 |
| 4.8 ...... | 7.8125 | 7.8125 | 7.8122 | 7.7965 | 7.7215 | 9.0299 |
| 4.3 ...... | 8.7570 | 8.7570 | 8.7561 | 8.7205 | 8.6374 | 10.1140 |
| 4.0 ...... | 10.3639 | 10.3639 | 10.3621 | 10.3083 | 10.2437 | 11.8020 |
| 3.7 ...... | 13.7621 | 13.7619 | 13.7584 | 13.6857 | 13.6379 | 15.2317 |

TABLE 6D

ION Ne III CONFIGURATION $2p^4$
TRANSITION $^1S_0$–$^3P_1$ WAVELENGTH (Å) 1814.8

−log (INTENSITY/$n^2N$ (Ne III))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 5.3 ...... | 7.5240 | 7.5240 | 7.5240 | 7.5167 | 7.4478 | 8.5653 |
| 4.8 ...... | 7.6518 | 7.6518 | 7.6515 | 7.6357 | 7.5611 | 8.8692 |
| 4.3 ...... | 8.5962 | 8.5962 | 8.5953 | 8.5599 | 8.4767 | 9.9534 |
| 4.0 ...... | 10.2032 | 10.2032 | 10.2014 | 10.1478 | 10.0830 | 11.6412 |
| 3.7 ...... | 13.6014 | 13.6013 | 13.5977 | 13.5249 | 13.4773 | 15.0711 |

TABLE 7A

ION Ne IV CONFIGURATION $2p^3$
TRANSITION $^2D_{5/2}$–$^4S_{3/2}$ WAVELENGTH (Å) 2441.3

−log (INTENSITY/$n^2N$ (Ne IV))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 5.6 ...... | 6.3588 | 6.3593 | 6.4086 | 7.4525 | 9.4096 | 11.4461 |
| 5.1 ...... | 6.2546 | 6.2553 | 6.3295 | 7.4972 | 9.4540 | 11.4667 |
| 4.6 ...... | 6.4622 | 6.4633 | 6.5571 | 7.7336 | 9.6490 | 11.6265 |
| 4.0 ...... | 8.1337 | 8.1352 | 8.2546 | 9.4097 | 11.3205 | 13.3140 |
| 3.8 ...... | 9.5918 | 9.5934 | 9.7217 | 10.8949 | 12.8168 | 14.8151 |
| 3.7 ...... | 10.6347 | 10.6363 | 10.7662 | 11.9431 | 13.8671 | 15.8659 |

TABLE 7B

ION Ne IV CONFIGURATION $2p^3$
TRANSITION $^2D_{3/2}$–$^4S_{3/2}$ WAVELENGTH (Å) 2438.6

−log (INTENSITY/$n^2N$ (Ne IV))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 5.6 ...... | 6.4800 | 6.4800 | 6.4785 | 6.7882 | 8.5696 | 10.6431 |
| 5.1 ...... | 6.3831 | 6.3829 | 6.3741 | 6.7732 | 8.6243 | 10.6642 |
| 4.6 ...... | 6.6089 | 6.6085 | 6.5768 | 6.9854 | 8.8340 | 10.8252 |
| 4.0 ...... | 8.3090 | 8.3079 | 8.2416 | 8.6601 | 10.5209 | 12.5150 |
| 3.8 ...... | 9.7715 | 9.7703 | 9.6991 | 10.1452 | 12.0200 | 14.0178 |
| 3.7 ...... | 10.8159 | 10.8147 | 10.7425 | 11.1942 | 13.0714 | 15.0699 |

TABLE 7C

ION Ne IV CONFIGURATION $2p^3$
TRANSITION $^2P_{3/2}$–$^4S_{3/2}$ WAVELENGTH (Å) 1608.8

−log (INTENSITY/$n^2N$ (Ne IV))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 5.6 ...... | 6.8064 | 6.8062 | 6.7964 | 6.7084 | 6.7791 | 8.1384 |
| 5.1 ...... | 6.7677 | 6.7673 | 6.7447 | 6.5975 | 6.7115 | 8.2238 |
| 4.6 ...... | 7.1880 | 7.1873 | 7.1334 | 6.8437 | 6.9875 | 8.6067 |
| 4.0 ...... | 9.8284 | 9.8270 | 9.7249 | 9.2782 | 9.5267 | 11.2798 |
| 3.8 ...... | 12.0583 | 12.0567 | 11.9464 | 11.4937 | 11.7778 | 13.5542 |
| 3.7 ...... | 13.6413 | 13.6397 | 13.5279 | 13.0749 | 13.3652 | 15.1457 |

TABLE 7D

ION Ne IV CONFIGURATION $2p^3$
TRANSITION $^2P_{1/2}$–$^4S_{3/2}$ WAVELENGTH (Å) 1609.0

−log (INTENSITY/$n^2N$ (Ne IV))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 5.6 ...... | 7.1849 | 7.1849 | 7.1791 | 7.0980 | 7.2789 | 8.8338 |
| 5.1 ...... | 7.1463 | 7.1461 | 7.1297 | 6.9850 | 7.2575 | 8.9214 |
| 4.6 ...... | 7.5665 | 7.5660 | 7.5216 | 7.2323 | 7.5780 | 9.3055 |
| 4.0 ...... | 10.2066 | 10.2054 | 10.1177 | 9.6719 | 10.1568 | 11.9791 |
| 3.8 ...... | 12.4361 | 12.4348 | 12.3397 | 11.8883 | 12.4136 | 14.2535 |
| 3.7 ...... | 14.0189 | 14.0175 | 13.9213 | 13.4692 | 14.0019 | 15.8447 |

TABLE 8A

ION Ne V CONFIGURATION $2p^2$
TRANSITION $^1D_2$–$^3P_1$ WAVELENGTH (Å) 3345.9

−log (INTENSITY/$n^2N$ (Ne V))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 5.7 ...... | 7.1237 | 7.1237 | 7.1233 | 7.1266 | 7.4479 | 9.1902 |
| 5.5 ...... | 7.0464 | 7.0464 | 7.0464 | 7.0502 | 7.4212 | 9.2022 |
| 5.3 ...... | 6.9832 | 6.9832 | 6.9831 | 6.9875 | 7.4095 | 9.2223 |
| 5.1 ...... | 6.9413 | 6.9413 | 6.9411 | 6.9458 | 7.4185 | 9.2560 |
| 4.4 ...... | 7.2119 | 7.2119 | 7.2100 | 7.2089 | 7.8358 | 9.7251 |
| 4.0 ...... | 8.1774 | 8.1774 | 8.1715 | 8.1539 | 8.8755 | 10.7903 |
| 3.7 ...... | 9.9985 | 9.9983 | 9.9860 | 9.9366 | 10.6958 | 12.6195 |

TABLE 8B

ION Ne V CONFIGURATION $2p^2$
TRANSITION $^1D_2$–$^3P_2$ WAVELENGTH (Å) 3425.8

−log (INTENSITY/$n^2N$ (Ne V))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 5.7 ...... | 6.6939 | 6.6939 | 6.6939 | 6.6970 | 7.0184 | 8.7605 |
| 5.5 ...... | 6.6167 | 6.6167 | 6.6167 | 6.6206 | 6.9915 | 8.7725 |
| 5.3 ...... | 6.5536 | 6.5536 | 6.5534 | 6.5579 | 6.9799 | 8.7926 |
| 5.1 ...... | 6.5117 | 6.5117 | 6.5115 | 6.5163 | 6.9889 | 8.8264 |
| 4.4 ...... | 6.7823 | 6.7823 | 6.7804 | 6.7792 | 7.4063 | 9.2953 |
| 4.0 ...... | 7.7478 | 7.7478 | 7.7419 | 7.7243 | 8.4459 | 10.3606 |
| 3.7 ...... | 9.5687 | 9.5687 | 9.5564 | 9.5069 | 10.2662 | 12.1898 |

TABLE 8C

ION Ne V CONFIGURATION $2p^2$
TRANSITION $^1S_0$–$^1D_2$ WAVELENGTH (Å) 2972.0

−log (INTENSITY/$n^2N$ (Ne V))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 5.7 ...... | 7.7850 | 7.7850 | 7.7846 | 7.7795 | 7.7659 | 8.6541 |
| 5.5 ...... | 7.7312 | 7.7312 | 7.7308 | 7.7249 | 7.7110 | 8.6810 |
| 5.3 ...... | 7.7049 | 7.7049 | 7.7043 | 7.6974 | 7.6819 | 8.7319 |
| 5.1 ...... | 7.7219 | 7.7219 | 7.7211 | 7.7122 | 7.6935 | 8.8206 |
| 4.4 ...... | 8.6471 | 8.6470 | 8.6442 | 8.6182 | 8.5691 | 9.9441 |
| 4.0 ...... | 10.8668 | 10.8668 | 10.8596 | 10.8074 | 10.7672 | 12.2633 |
| 3.7 ...... | 14.7712 | 14.7710 | 14.7573 | 14.6689 | 14.6400 | 16.1750 |

TABLE 8D

ION Ne V CONFIGURATION $2p^2$
TRANSITION $^1S_0$–$^3P_1$ WAVELENGTH (Å) 1575.2

−log (INTENSITY/$n^2N$ (Ne V))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 5.7 ...... | 7.3006 | 7.3006 | 7.3002 | 7.2951 | 7.2816 | 8.1697 |
| 5.5 ...... | 7.2468 | 7.2468 | 7.2463 | 7.2405 | 7.2264 | 8.1965 |
| 5.3 ...... | 7.2206 | 7.2206 | 7.2199 | 7.2130 | 7.1974 | 8.2473 |
| 5.1 ...... | 7.2374 | 7.2374 | 7.2365 | 7.2280 | 7.2091 | 8.3362 |
| 4.4 ...... | 8.1628 | 8.1626 | 8.1597 | 8.1338 | 8.0847 | 9.4598 |
| 4.0 ...... | 10.3824 | 10.3824 | 10.3753 | 10.3230 | 10.2828 | 11.7789 |
| 3.7 ...... | 14.2869 | 14.2867 | 14.2728 | 14.1845 | 14.1556 | 15.6907 |

TABLE 9A

ION Mg V CONFIGURATION $2p^4$
TRANSITION $^1D_2$–$^3P_2$ WAVELENGTH (Å) 2750.4

−log (INTENSITY/$n^2N$ (Mg V))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 5.8 ...... | 7.3008 | 7.3008 | 7.3008 | 7.3013 | 7.3592 | 8.4928 |
| 5.3 ...... | 7.1291 | 7.1291 | 7.1291 | 7.1300 | 7.2212 | 8.5271 |
| 4.8 ...... | 7.1265 | 7.1265 | 7.1265 | 7.1271 | 7.2543 | 8.6877 |
| 4.3 ...... | 7.6521 | 7.6521 | 7.6517 | 7.6497 | 7.8089 | 9.3464 |
| 4.0 ...... | 8.6437 | 8.6437 | 8.6435 | 8.6361 | 8.8158 | 10.4185 |
| 3.7 ...... | 10.8134 | 10.8134 | 10.8130 | 10.7971 | 10.9683 | 12.6004 |

TABLE 9B

ION Mg V CONFIGURATION $2p^4$
TRANSITION $^1D_2$–$^3P_1$ WAVELENGTH (Å) 2892.0

−log (INTENSITY/$n^2N$ (Mg V))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 5.8 ...... | 7.8669 | 7.8669 | 7.8669 | 7.8675 | 7.9254 | 9.0589 |
| 5.3 ...... | 7.6953 | 7.6953 | 7.6953 | 7.6961 | 7.7873 | 9.0933 |
| 4.8 ...... | 7.6927 | 7.6927 | 7.6927 | 7.6934 | 7.8206 | 9.2539 |
| 4.3 ...... | 8.2182 | 8.2182 | 8.2180 | 8.2159 | 8.3751 | 9.9127 |
| 4.0 ...... | 9.2098 | 9.2098 | 9.2097 | 9.2024 | 9.3820 | 10.9846 |
| 3.7 ...... | 11.3795 | 11.3795 | 11.3792 | 11.3632 | 11.5344 | 13.1667 |

TABLE 9C

ION Mg V CONFIGURATION $2p^4$
TRANSITION $^1S_0$–$^1D_2$ WAVELENGTH (Å) 2416.8

−log (INTENSITY/$n^2N$ (Mg V))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 5.8 ...... | 8.8165 | 8.8165 | 8.8165 | 8.8164 | 8.8080 | 9.0771 |
| 5.3 ...... | 8.7316 | 8.7316 | 8.7316 | 8.7312 | 8.7133 | 9.1153 |
| 4.8 ...... | 9.0048 | 9.0048 | 9.0047 | 9.0031 | 8.9588 | 9.4977 |
| 4.3 ...... | 10.4080 | 10.4080 | 10.4080 | 10.4021 | 10.3057 | 11.0006 |
| 4.0 ...... | 12.6839 | 12.6839 | 12.6837 | 12.6716 | 12.5420 | 13.3440 |
| 3.7 ...... | 17.4170 | 17.4170 | 17.4167 | 17.3951 | 17.2306 | 18.0847 |

TABLE 9D

ION Mg V CONFIGURATION $2p^4$
TRANSITION $^1S_0$–$^3P_1$ WAVELENGTH (Å) 1317.0

−log (INTENSITY/$n^2N$ (Mg V))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 5.8 ...... | 7.8168 | 7.8168 | 7.8168 | 7.8166 | 7.8083 | 8.0773 |
| 5.3 ...... | 7.7318 | 7.7318 | 7.7318 | 7.7314 | 7.7135 | 8.1156 |
| 4.8 ...... | 8.0049 | 8.0049 | 8.0049 | 8.0034 | 7.9592 | 8.4979 |
| 4.3 ...... | 9.4082 | 9.4082 | 9.4082 | 9.4023 | 9.3059 | 10.0009 |
| 4.0 ...... | 11.6842 | 11.6842 | 11.6839 | 11.6718 | 11.5421 | 12.3442 |
| 3.7 ...... | 16.4172 | 16.4172 | 16.4169 | 16.3953 | 16.2308 | 17.0847 |

TABLE 10A

ION Mg VI CONFIGURATION $2p^3$
TRANSITION $^2D_{5/2}$–$^4S_{3/2}$ WAVELENGTH (Å) 1846.7

−log (INTENSITY/$n^2N$ (Mg VI))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 5.9 ...... | 7.0885 | 7.0885 | 7.0913 | 7.3026 | 8.8605 | 10.8572 |
| 5.7 ...... | 7.0146 | 7.0146 | 7.0180 | 7.2653 | 8.8668 | 10.8624 |
| 5.5 ...... | 6.9558 | 6.9558 | 6.9599 | 7.2448 | 8.8792 | 10.8700 |
| 5.4 ...... | 6.9347 | 6.9347 | 6.9394 | 7.2428 | 8.8887 | 10.8754 |

TABLE 10B

ION Mg VI CONFIGURATION $2p^3$
TRANSITION $^2D_{3/2}$–$^4S_{3/2}$ WAVELENGTH (Å) 1846.0

−log (INTENSITY/$n^2N$ (Mg VI))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 5.9 ...... | 7.1939 | 7.1939 | 7.1936 | 7.1808 | 7.7266 | 9.6620 |
| 5.7 ...... | 7.1218 | 7.1218 | 7.1214 | 7.1048 | 7.7158 | 9.6709 |
| 5.5 ...... | 7.0658 | 7.0658 | 7.0653 | 7.0427 | 7.7154 | 9.6823 |
| 5.4 ...... | 7.0468 | 7.0468 | 7.0459 | 7.0195 | 7.7203 | 9.6893 |

TABLE 10C

ION Mg VI — CONFIGURATION $2p^3$
TRANSITION $^2P_{3/2}$–$^4S_{3/2}$ — WAVELENGTH (Å) 1207.3

−log (INTENSITY/$n^2N$ (Mg VI))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 5.9 ...... | 7.4322 | 7.4322 | 7.4317 | 7.4024 | 7.3418 | 7.7183 |
| 5.7 ...... | 7.3706 | 7.3706 | 7.3701 | 7.3332 | 7.2668 | 7.6992 |
| 5.5 ...... | 7.3316 | 7.3316 | 7.3306 | 7.2837 | 7.2067 | 7.6959 |
| 5.4 ...... | 7.3244 | 7.3244 | 7.3232 | 7.2696 | 7.1851 | 7.7019 |

TABLE 10D

ION Mg VI — CONFIGURATION $2p^3$
TRANSITION $^2P_{1/2}$–$^4S_{3/2}$ — WAVELENGTH (Å) 1209.0

−log (INTENSITY/$n^2N$ (Mg VI))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 5.9 ...... | 7.7427 | 7.7427 | 7.7424 | 7.7277 | 7.6737 | 8.3141 |
| 5.7 ...... | 7.6809 | 7.6809 | 7.6809 | 7.6607 | 7.6004 | 8.3104 |
| 5.5 ...... | 7.6420 | 7.6420 | 7.6414 | 7.6128 | 7.5429 | 8.3203 |
| 5.4 ...... | 7.6347 | 7.6347 | 7.6340 | 7.5997 | 7.5230 | 8.3323 |

TABLE 11A

ION Mg VII — CONFIGURATION $2p^2$
TRANSITION $^1D_2$–$^3P_1$ — WAVELENGTH (Å) 2480.5

−log (INTENSITY/$n^2N$ (Mg VII))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.1 ...... | 7.9272 | 7.9272 | 7.9272 | 7.9274 | 7.9509 | 8.7548 |
| 6.0 ...... | 7.8825 | 7.8825 | 7.8825 | 7.8826 | 7.9086 | 8.7510 |
| 5.8 ...... | 7.7975 | 7.7975 | 7.7975 | 7.7977 | 7.8294 | 8.7474 |
| 5.6 ...... | 7.7215 | 7.7215 | 7.7215 | 7.7219 | 7.7597 | 8.7513 |

TABLE 11B

ION Mg VII — CONFIGURATION $2p^2$
TRANSITION $^1D_2$–$^3P_2$ — WAVELENGTH (Å) 2597.3

−log (INTENSITY/$n^2N$ (Mg VII))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.1 ...... | 7.5292 | 7.5292 | 7.5292 | 7.5295 | 7.5529 | 8.3569 |
| 6.0 ...... | 7.4846 | 7.4846 | 7.4846 | 7.4848 | 7.5108 | 8.3530 |
| 5.8 ...... | 7.3997 | 7.3997 | 7.3997 | 7.3997 | 7.4315 | 8.3495 |
| 5.6 ...... | 7.3238 | 7.3238 | 7.3238 | 7.3238 | 7.3619 | 8.3534 |

TABLE 11C

ION Mg VII — CONFIGURATION $2p^2$
TRANSITION $^1S_0$–$^1D_2$ — WAVELENGTH (Å) 2260.8

−log (INTENSITY/$n^2N$ (Mg VII))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.1 ...... | 9.1324 | 9.1324 | 9.1324 | 9.1313 | 9.1207 | 9.2299 |
| 6.0 ...... | 9.0933 | 9.0933 | 9.0933 | 9.0920 | 9.0808 | 9.2062 |
| 5.8 ...... | 9.0242 | 9.0242 | 9.0242 | 9.0225 | 9.0097 | 9.1704 |
| 5.6 ...... | 8.9734 | 8.9734 | 8.9734 | 8.9713 | 8.9561 | 9.1554 |

TABLE 11D

ION Mg VII — CONFIGURATION $2p^2$
TRANSITION $^1S_0$–$^3P_1$ — WAVELENGTH (Å) 1183.2

−log (INTENSITY/$n^2N$ (Mg VII))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.1 ...... | 7.9251 | 7.9251 | 7.9251 | 7.9240 | 7.9134 | 8.0226 |
| 6.0 ...... | 7.8861 | 7.8861 | 7.8859 | 7.8847 | 7.8735 | 7.9988 |
| 5.8 ...... | 7.8169 | 7.8169 | 7.8169 | 7.8153 | 7.8025 | 7.9631 |
| 5.6 ...... | 7.7662 | 7.7662 | 7.7662 | 7.7642 | 7.7489 | 7.9481 |

TABLE 12A

ION Si VII — CONFIGURATION $2p^4$
TRANSITION $^1D_2$–$^3P_2$ — WAVELENGTH (Å) 2127.0

−log (INTENSITY/$n^2N$ (Si VII))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.1 ...... | 7.4959 | 7.4959 | 7.4959 | 7.4960 | 7.5008 | 7.8290 |
| 6.0 ...... | 7.4516 | 7.4516 | 7.4516 | 7.4517 | 7.4570 | 7.8108 |
| 5.8 ...... | 7.3687 | 7.3687 | 7.3687 | 7.3687 | 7.3752 | 7.7820 |
| 5.6 ...... | 7.2959 | 7.2959 | 7.2959 | 7.2960 | 7.3037 | 7.7655 |

TABLE 12B

ION Si VII — CONFIGURATION $2p^4$
TRANSITION $^1D_2$–$^3P_1$ — WAVELENGTH (Å) 2326.5

−log (INTENSITY/$n^2N$ (Si VII))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.1 ...... | 8.1273 | 8.1273 | 8.1273 | 8.1273 | 8.1322 | 8.4605 |
| 6.0 ...... | 8.0830 | 8.0830 | 8.0830 | 8.0830 | 8.0883 | 8.4422 |
| 5.8 ...... | 8.0000 | 8.0000 | 8.0000 | 8.0000 | 8.0065 | 8.4134 |
| 5.6 ...... | 7.9273 | 7.9273 | 7.9273 | 7.9273 | 7.9352 | 8.3969 |

TABLE 12C

ION Si VII — CONFIGURATION $2p^4$
TRANSITION $^1S_0$–$^1D_2$ — WAVELENGTH (Å) 1894.7

−log (INTENSITY/$n^2N$ (Si VII))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.1 ...... | 9.6254 | 9.6254 | 9.6254 | 9.6254 | 9.6247 | 9.6250 |
| 6.0 ...... | 9.5878 | 9.5878 | 9.5878 | 9.5878 | 9.5870 | 9.5891 |
| 5.8 ...... | 9.5238 | 9.5238 | 9.5238 | 9.5238 | 9.5226 | 9.5291 |
| 5.6 ...... | 9.4815 | 9.4815 | 9.4815 | 9.4815 | 9.4795 | 9.4902 |

TABLE 12D

ION Si VII — CONFIGURATION $2p^4$
TRANSITION $^1S_0$–$^3P_1$ — WAVELENGTH (Å) 1044.4

−log (INTENSITY/$n^2N$ (Si VII))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.1 ...... | 7.9389 | 7.9389 | 7.9389 | 7.9389 | 7.9382 | 7.9385 |
| 6.0 ...... | 7.9013 | 7.9013 | 7.9013 | 7.9013 | 7.9004 | 7.9025 |
| 5.8 ...... | 7.8374 | 7.8374 | 7.8374 | 7.8374 | 7.8361 | 7.8424 |
| 5.6 ...... | 7.7950 | 7.7950 | 7.7950 | 7.7950 | 7.7929 | 7.8037 |

TABLE 13A

ION Si VIII — CONFIGURATION $2p^3$
TRANSITION $^2D_{3/2}$–$^4S_{3/2}$ — WAVELENGTH (Å) 1489.4

−log (INTENSITY/$n^2N$ (Si VIII))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.2 ...... | 7.4471 | 7.4471 | 7.4470 | 7.4456 | 7.4473 | 8.4540 |
| 6.1 ...... | 7.4052 | 7.4052 | 7.4052 | 7.4035 | 7.4073 | 8.4535 |
| 6.0 ...... | 7.3649 | 7.3649 | 7.3649 | 7.3630 | 7.3689 | 8.4547 |
| 5.8 ...... | 7.2926 | 7.2926 | 7.2926 | 7.2897 | 7.2999 | 8.4601 |

TABLE 13B

ION Si VIII — CONFIGURATION $2p^3$
TRANSITION $^2D_{5/2}$–$^4S_{3/2}$ — WAVELENGTH (Å) 1483.2

−log (INTENSITY/$n^2N$ (Si VIII))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.2 ...... | 7.3462 | 7.3462 | 7.3463 | 7.3612 | 7.9970 | 9.8528 |
| 6.1 ...... | 7.3040 | 7.3040 | 7.3040 | 7.3205 | 7.9906 | 9.8546 |
| 6.0 ...... | 7.2628 | 7.2628 | 7.2630 | 7.2814 | 7.9861 | 9.8569 |
| 5.8 ...... | 7.1888 | 7.1888 | 7.1890 | 7.2113 | 7.9839 | 9.8638 |

TABLE 13C

ION Si VIII — CONFIGURATION $2p^3$
TRANSITION $^2P_{3/2}$–$^4S_{3/2}$ — WAVELENGTH (Å) 962.46

−log (INTENSITY/$n^2N$ (Si VIII))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.2 ...... | 7.6749 | 7.6749 | 7.6749 | 7.6720 | 7.6091 | 7.6052 |
| 6.1 ...... | 7.6362 | 7.6362 | 7.6361 | 7.6328 | 7.5668 | 7.5672 |
| 6.0 ...... | 7.5994 | 7.5994 | 7.5994 | 7.5958 | 7.5258 | 7.5310 |
| 5.8 ...... | 7.5381 | 7.5381 | 7.5381 | 7.5329 | 7.4538 | 7.4671 |

TABLE 14A

ION Si IX — CONFIGURATION $2p^2$
TRANSITION $^1D_2$–$^3P_1$ — WAVELENGTH (Å) 1985.3

−log (INTENSITY/$n^2N$ (Si IX))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.3 ...... | 8.1210 | 8.1210 | 8.1210 | 8.1210 | 8.1218 | 8.2913 |
| 6.2 ...... | 8.0749 | 8.0749 | 8.0749 | 8.0749 | 8.0759 | 8.2616 |
| 6.1 ...... | 8.0310 | 8.0310 | 8.0310 | 8.0310 | 8.0319 | 8.2346 |
| 5.9 ...... | 7.9462 | 7.9462 | 7.9462 | 7.9462 | 7.9471 | 8.1868 |

TABLE 14B

ION Si IX — CONFIGURATION $2p^2$
TRANSITION $^1D_2$–$^3P_2$ — WAVELENGTH (Å) 2149.9

−log (INTENSITY/$n^2N$ (Si IX))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.3 ...... | 7.7844 | 7.7844 | 7.7844 | 7.7844 | 7.7852 | 7.9548 |
| 6.2 ...... | 7.7383 | 7.7383 | 7.7383 | 7.7383 | 7.7392 | 7.9249 |
| 6.1 ...... | 7.6944 | 7.6944 | 7.6944 | 7.6944 | 7.6953 | 7.8979 |
| 5.9 ...... | 7.6097 | 7.6097 | 7.6097 | 7.6097 | 7.6106 | 7.8501 |

TABLE 14C

ION Si IX — CONFIGURATION $2p^2$
TRANSITION $^1S_0$–$^1D_2$ — WAVELENGTH (Å) 1824.2

−log (INTENSITY/$n^2N$ (Si IX))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.3 ...... | 9.9695 | 9.9695 | 9.9695 | 9.9695 | 9.9695 | 9.9552 |
| 6.2 ...... | 9.9281 | 9.9281 | 9.9281 | 9.9281 | 9.9279 | 9.9124 |
| 6.1 ...... | 9.8897 | 9.8897 | 9.8897 | 9.8897 | 9.8893 | 9.8727 |
| 5.9 ...... | 9.8207 | 9.8207 | 9.8207 | 9.8207 | 9.8199 | 9.8009 |

TABLE 14D

ION Si IX — CONFIGURATION $2p^2$
TRANSITION $^1S_0$–$^3P_1$ — WAVELENGTH (Å) 950.66

−log (INTENSITY/$n^2N$ (Si IX))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.3 ...... | 8.0999 | 8.0999 | 8.0999 | 8.0999 | 8.0999 | 8.0854 |
| 6.2 ...... | 8.0583 | 8.0583 | 8.0583 | 8.0583 | 8.0581 | 8.0426 |
| 6.1 ...... | 8.0199 | 8.0199 | 8.0199 | 8.0199 | 8.0195 | 8.0030 |
| 5.9 ...... | 7.9510 | 7.9510 | 7.9510 | 7.9509 | 7.9501 | 7.9312 |

TABLE 15A

ION S II — CONFIGURATION $3p^3$
TRANSITION $^2D_{3/2}$–$^4S_{3/2}$ — WAVELENGTH (Å) 6730.78

−log (INTENSITY/$n^2N$ (S II))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 4.8 ...... | 6.9553 | 6.9553 | 7.0154 | 8.3863 | 10.4211 | 12.4250 |
| 4.4 ...... | 7.0108 | 7.0097 | 7.0618 | 8.4802 | 10.4714 | 12.4712 |
| 4.1 ...... | 7.2777 | 7.2754 | 7.2948 | 8.6846 | 10.6409 | 12.6390 |
| 4.0 ...... | 7.4419 | 7.4391 | 7.4443 | 8.8130 | 10.7652 | 12.7630 |
| 3.7 ...... | 8.3353 | 8.3319 | 8.3006 | 9.5965 | 11.5645 | 13.5636 |

TABLE 15B

ION S II — CONFIGURATION $3p^3$
TRANSITION $^2D_{5/2}$–$^4S_{3/2}$ — WAVELENGTH (Å) 6716.42

−log (INTENSITY/$n^2N$ (S II))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 4.8 ...... | 6.8269 | 6.8322 | 7.1653 | 8.8475 | 10.8339 | 12.8330 |
| 4.4 ...... | 6.8715 | 6.8780 | 7.2498 | 8.9305 | 10.8849 | 12.8821 |
| 4.1 ...... | 7.1253 | 7.1319 | 7.4945 | 9.1242 | 11.0588 | 13.0556 |
| 4.0 ...... | 7.2847 | 7.2913 | 7.6441 | 9.2497 | 11.1859 | 13.1829 |
| 3.7 ...... | 8.1677 | 8.1736 | 8.4930 | 10.0340 | 12.0009 | 13.9997 |

TABLE 16A

ION S III — CONFIGURATION $3p^2$
TRANSITION $^1D_2$–$^3P_1$ — WAVELENGTH (Å) 9069.4

−log (INTENSITY/$n^2N$ (S III))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 5.2 ...... | 7.5430 | 7.5430 | 7.5440 | 7.6922 | 9.1970 | 11.2039 |
| 4.8 ...... | 7.4218 | 7.4218 | 7.4220 | 7.6253 | 9.2379 | 11.2411 |
| 4.3 ...... | 7.4435 | 7.4433 | 7.4381 | 7.7078 | 9.4025 | 11.4006 |
| 4.0 ...... | 7.6849 | 7.6843 | 7.6696 | 7.9644 | 9.6834 | 11.6799 |
| 3.8 ...... | 8.0551 | 8.0540 | 8.0286 | 8.3238 | 10.0478 | 12.0441 |

TABLE 16B

ION S III — CONFIGURATION $3p^2$
TRANSITION $^1D_2$–$^3P_2$ — WAVELENGTH (Å) 9532.1

−log (INTENSITY/$n^2N$ (S III))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 5.2 ...... | 7.1564 | 7.1564 | 7.1573 | 7.3056 | 8.8104 | 10.8174 |
| 4.8 ...... | 7.0352 | 7.0352 | 7.0353 | 7.2388 | 8.8513 | 10.8545 |
| 4.3 ...... | 7.0568 | 7.0568 | 7.0516 | 7.3211 | 9.0159 | 11.0141 |
| 4.0 ...... | 7.2982 | 7.2976 | 7.2831 | 7.5777 | 9.2967 | 11.2933 |
| 3.8 ...... | 7.6684 | 7.6673 | 7.6420 | 7.9371 | 9.6612 | 11.6575 |

TABLE 16C

ION S III — CONFIGURATION $3p^2$
TRANSITION $^1S_0$–$^1D_2$ — WAVELENGTH (Å) 6312.1

−log (INTENSITY/$n^2N$ (S III))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 5.2 ...... | 7.7606 | 7.7606 | 7.7589 | 7.7037 | 8.0076 | 9.8037 |
| 4.8 ...... | 7.7232 | 7.7232 | 7.7192 | 7.6406 | 8.0758 | 9.9339 |
| 4.3 ...... | 8.0591 | 8.0587 | 8.0466 | 7.9187 | 8.5200 | 10.4302 |
| 4.0 ...... | 8.7782 | 8.7774 | 8.7542 | 8.5853 | 9.2720 | 11.2014 |
| 3.8 ...... | 9.7214 | 9.7203 | 9.6849 | 9.4899 | 10.2076 | 12.1434 |

TABLE 17A

ION S IX — CONFIGURATION $2p^4$
TRANSITION $^1D_2$–$^3P_2$ — WAVELENGTH (Å) 1724.1

−log (INTENSITY/$n^2N$ (S IX))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.3 ...... | 7.9298 | 7.9298 | 7.9298 | 7.9298 | 7.9303 | 7.9850 |
| 6.2 ...... | 7.8842 | 7.8842 | 7.8842 | 7.8842 | 7.8849 | 7.9453 |
| 6.0 ...... | 7.7981 | 7.7981 | 7.7981 | 7.7981 | 7.7989 | 7.8723 |
| 5.9 ...... | 7.7575 | 7.7575 | 7.7575 | 7.7575 | 7.7585 | 7.8390 |

TABLE 17B

ION S IX — CONFIGURATION $2p^4$
TRANSITION $^1D_2$–$^3P_1$ — WAVELENGTH (Å) 1998.8

−log (INTENSITY/$n^2N$ (S IX))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.3 ...... | 8.6544 | 8.6544 | 8.6544 | 8.6544 | 8.6550 | 8.7097 |
| 6.2 ...... | 8.6088 | 8.6088 | 8.6088 | 8.6088 | 8.6095 | 8.6700 |
| 6.0 ...... | 8.5227 | 8.5227 | 8.5227 | 8.5227 | 8.5235 | 8.5969 |
| 5.9 ...... | 8.4822 | 8.4822 | 8.4822 | 8.4822 | 8.4830 | 8.5635 |

TABLE 17C

Ion S IX — Configuration $2p^4$
Transition $^1S_0$–$^1D_2$ — Wavelength (Å) 1555.2

−log (Intensity/$n^2N$ (S IX))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.3 ...... | 10.6443 | 10.6443 | 10.6443 | 10.6443 | 10.6444 | 10.6418 |
| 6.2 ...... | 10.6040 | 10.6040 | 10.6040 | 10.6040 | 10.6041 | 10.6007 |
| 6.0 ...... | 10.5325 | 10.5325 | 10.5325 | 10.5325 | 10.5326 | 10.5273 |
| 5.9 ...... | 10.5024 | 10.5024 | 10.5024 | 10.5024 | 10.5024 | 10.4957 |

TABLE 17D

Ion S IX — Configuration $2p^4$
Transition $^1D_2$–$^3P_0$ — Wavelength (Å) 2110.4

−log (Intensity/$n^2N$ (S IX))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.3 ...... | 12.9493 | 12.9493 | 12.9493 | 12.9493 | 12.9499 | 13.0046 |
| 6.2 ...... | 12.9037 | 12.9037 | 12.9037 | 12.9037 | 12.9045 | 12.9649 |
| 6.0 ...... | 12.8176 | 12.8176 | 12.8176 | 12.8176 | 12.8184 | 12.8919 |
| 5.9 ...... | 12.7772 | 12.7772 | 12.7772 | 12.7772 | 12.7780 | 12.8586 |

TABLE 18A

Ion S X — Configuration $2p^3$
Transition $^2D_{3/2}$–$^4S_{3/2}$ — Wavelength (Å) 1213.6

−log (Intensity/$n^2N$ (S X))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.3 ...... | 7.8744 | 7.8744 | 7.8744 | 7.8743 | 7.8702 | 8.0625 |
| 6.2 ...... | 7.8317 | 7.8317 | 7.8317 | 7.8316 | 7.8267 | 8.0374 |
| 6.1 ...... | 7.7915 | 7.7915 | 7.7915 | 7.7913 | 7.7856 | 8.0149 |
| 6.0 ...... | 7.7530 | 7.7530 | 7.7530 | 7.7529 | 7.7460 | 7.9947 |

TABLE 18B

Ion S X — Configuration $2p^3$
Transition $^2D_{5/2}$–$^4S_{3/2}$ — Wavelength (Å) 1196.9

−log (Intensity/$n^2N$ (S X))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.3 ...... | 7.8032 | 7.8032 | 7.8032 | 7.8043 | 7.9012 | 9.2062 |
| 6.2 ...... | 7.7600 | 7.7600 | 7.7600 | 7.7613 | 7.8679 | 9.2065 |
| 6.1 ...... | 7.7192 | 7.7192 | 7.7192 | 7.7205 | 7.8376 | 9.2075 |
| 6.0 ...... | 7.6801 | 7.6801 | 7.6802 | 7.6816 | 7.8098 | 9.2098 |

TABLE 18C

Ion S X — Configuration $2p^3$
Transition $^2P_{3/2}$–$^2D_{3/2}$ — Wavelength (Å) 2156.5

−log (Intensity/$n^2N$ (S X))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.3 ...... | 9.0648 | 9.0648 | 9.0648 | 9.0646 | 9.0457 | 8.9682 |
| 6.2 ...... | 9.0250 | 9.0250 | 9.0250 | 9.0248 | 9.0037 | 8.9249 |
| 6.1 ...... | 8.9885 | 8.9885 | 8.9885 | 8.9882 | 8.9646 | 8.8841 |
| 6.0 ...... | 8.9550 | 8.9550 | 8.9550 | 8.9547 | 8.9283 | 8.8451 |

TABLE 19A

Ion S XI — Configuration $2p^2$
Transition $^1D_2$–$^3P_1$ — Wavelength (Å) 1614.8

−log (Intensity/$n^2N$ (S XI))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.3 ...... | 8.4568 | 8.4568 | 8.4568 | 8.4568 | 8.4572 | 8.4861 |
| 6.2 ...... | 8.4120 | 8.4120 | 8.4120 | 8.4120 | 8.4123 | 8.4441 |
| 6.1 ...... | 8.3695 | 8.3695 | 8.3695 | 8.3695 | 8.3697 | 8.4045 |
| 6.0 ...... | 8.3279 | 8.3279 | 8.3279 | 8.3279 | 8.3282 | 8.3663 |

TABLE 19B

Ion S XI — Configuration $2p^2$
Transition $^1D_2$–$^3P_2$ — Wavelength (Å) 1826.2

−log (Intensity/$n^2N$ (S XI))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.3 ...... | 8.1948 | 8.1948 | 8.1948 | 8.1948 | 8.1951 | 8.2239 |
| 6.2 ...... | 8.1498 | 8.1498 | 8.1498 | 8.1498 | 8.1501 | 8.1819 |
| 6.1 ...... | 8.1073 | 8.1073 | 8.1073 | 8.1073 | 8.1075 | 8.1422 |
| 6.0 ...... | 8.0659 | 8.0659 | 8.0659 | 8.0659 | 8.0659 | 8.1040 |

TABLE 19C

Ion S XI — Configuration $2p^2$
Transition $^1S_0$–$^1D_2$ — Wavelength (Å) 1519.2

−log (Intensity/$n^2N$ (S XI))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.3 ...... | 10.9400 | 10.9400 | 10.9400 | 10.9400 | 10.9398 | 10.9320 |
| 6.2 ...... | 10.9003 | 10.9003 | 10.9003 | 10.9003 | 10.9003 | 10.8910 |
| 6.1 ...... | 10.8644 | 10.8644 | 10.8644 | 10.8644 | 10.8641 | 10.8535 |
| 6.0 ...... | 10.8313 | 10.8313 | 10.8313 | 10.8313 | 10.8311 | 10.8185 |

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TABLE 19D

ION S XI — CONFIGURATION $2p^2$
TRANSITION $^1D_2$–$^3P_0$ — WAVELENGTH (Å) 1489.1

−log (INTENSITY/$n^2N$ (S XI))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.3 ...... | 12.5679 | 12.5679 | 12.5679 | 12.5679 | 12.5681 | 12.5970 |
| 6.2 ...... | 12.5230 | 12.5230 | 12.5230 | 12.5230 | 12.5233 | 12.5551 |
| 6.1 ...... | 12.4804 | 12.4804 | 12.4804 | 12.4804 | 12.4806 | 12.5155 |
| 6.0 ...... | 12.4389 | 12.4389 | 12.4389 | 12.4389 | 12.4391 | 12.4772 |

TABLE 20A

ION Fe XI — CONFIGURATION $3p^4$
TRANSITION $^1D_2$–$^3P_2$ — WAVELENGTH (Å) 2649.0

−log (INTENSITY/$n^2N$ (Fe XI))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.3 ...... | 8.1697 | 8.1697 | 8.1697 | 8.1697 | 8.1697 | 8.2048 |
| 6.2 ...... | 8.1224 | 8.1224 | 8.1224 | 8.1224 | 8.1228 | 8.1614 |
| 6.1 ...... | 8.0769 | 8.0769 | 8.0769 | 8.0769 | 8.0773 | 8.1198 |
| 6.0 ...... | 8.0317 | 8.0317 | 8.0317 | 8.0317 | 8.0317 | 8.0788 |

TABLE 20B

ION Fe XI — CONFIGURATION $3p^4$
TRANSITION $^1D_2$–$^3P_1$ — WAVELENGTH (Å) 3986.8

−log (INTENSITY/$n^2N$ (Fe XI))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.3 ...... | 9.3377 | 9.3377 | 9.3377 | 9.3377 | 9.3379 | 9.3729 |
| 6.2 ...... | 9.2906 | 9.2906 | 9.2906 | 9.2906 | 9.2908 | 9.3294 |
| 6.1 ...... | 9.2452 | 9.2452 | 9.2452 | 9.2452 | 9.2454 | 9.2880 |
| 6.0 ...... | 9.1997 | 9.1997 | 9.1997 | 9.1997 | 9.1999 | 9.2469 |

TABLE 20C

ION Fe XI — CONFIGURATION $3p^4$
TRANSITION $^1S_0$–$^1D_2$ — WAVELENGTH (Å) 2341.8

−log (INTENSITY/$n^2N$ (Fe XI))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.3 ...... | 11.0079 | 11.0079 | 11.0079 | 11.0079 | 11.0065 | 10.8957 |
| 6.2 ...... | 10.9643 | 10.9643 | 10.9643 | 10.9643 | 10.9626 | 10.8413 |
| 6.1 ...... | 10.9232 | 10.9232 | 10.9232 | 10.9230 | 10.9212 | 10.7887 |
| 6.0 ...... | 10.8832 | 10.8832 | 10.8832 | 10.8832 | 10.8810 | 10.7366 |

TABLE 20D

ION Fe XI — CONFIGURATION $3p^4$
TRANSITION $^1S_0$–$^3P_1$ — WAVELENGTH (Å) 1467.0

−log (INTENSITY/$n^2N$ (Fe XI))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.3 ...... | 8.8143 | 8.8143 | 8.8143 | 8.8142 | 8.8128 | 8.7020 |
| 6.2 ...... | 8.7707 | 8.7707 | 8.7707 | 8.7707 | 8.7689 | 8.6476 |
| 6.1 ...... | 8.7294 | 8.7294 | 8.7294 | 8.7294 | 8.7275 | 8.5951 |
| 6.0 ...... | 8.6896 | 8.6896 | 8.6896 | 8.6894 | 8.6873 | 8.5428 |

TABLE 21A

ION Fe XII — CONFIGURATION $3p^3$
TRANSITION $^2D_{3/2}$–$^4S_{3/2}$ — WAVELENGTH (Å) 2406.0

−log (INTENSITY/$n^2N$ (Fe XII))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.3 ...... | 8.0860 | 8.0860 | 8.0860 | 8.0860 | 8.0872 | 8.1735 |
| 6.2 ...... | 8.0396 | 8.0396 | 8.0396 | 8.0396 | 8.0411 | 8.1354 |
| 6.1 ...... | 7.9951 | 7.9951 | 7.9951 | 7.9952 | 7.9967 | 8.0993 |
| 6.0 ...... | 7.9511 | 7.9511 | 7.9511 | 7.9511 | 7.9529 | 8.0643 |

TABLE 21B

ION Fe XII — CONFIGURATION $3p^3$
TRANSITION $^2D_{5/2}$–$^4S_{3/2}$ — WAVELENGTH (Å) 2170.0

−log (INTENSITY/$n^2N$ (Fe XII))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.3 ...... | 8.2134 | 8.2134 | 8.2134 | 8.2137 | 8.2312 | 8.9161 |
| 6.2 ...... | 8.1671 | 8.1671 | 8.1671 | 8.1671 | 8.1870 | 8.9068 |
| 6.1 ...... | 8.1224 | 8.1224 | 8.1224 | 8.1226 | 8.1445 | 8.8984 |
| 6.0 ...... | 8.0784 | 8.0784 | 8.0784 | 8.0784 | 8.1029 | 8.8913 |

TABLE 21C

ION Fe XII — CONFIGURATION $3p^3$
TRANSITION $^2P_{3/2}$–$^4S_{3/2}$ — WAVELENGTH (Å) 1242.2

−log (INTENSITY/$n^2N$ (Fe XII))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.3 ...... | 8.5903 | 8.5903 | 8.5903 | 8.5900 | 8.5595 | 8.1693 |
| 6.2 ...... | 8.5466 | 8.5466 | 8.5466 | 8.5462 | 8.5122 | 8.1158 |
| 6.1 ...... | 8.5054 | 8.5054 | 8.5054 | 8.5049 | 8.4671 | 8.0649 |
| 6.0 ...... | 8.4654 | 8.4654 | 8.4654 | 8.4649 | 8.4231 | 8.0152 |

TABLE 22A

Ion Fe xiii — Configuration $3p^2$
Transition $^1D_2$–$^3P_1$ — Wavelength (Å) 2580.0

−log (Intensity/$n^2N$ (Fe xiii))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.3 ...... | 8.5959 | 8.5959 | 8.5959 | 8.5959 | 8.5960 | 8.6136 |
| 6.2 ...... | 8.5494 | 8.5494 | 8.5494 | 8.5494 | 8.5495 | 8.5688 |
| 6.1 ...... | 8.5051 | 8.5051 | 8.5051 | 8.5051 | 8.5053 | 8.5259 |
| 6.0 ...... | 8.4609 | 8.4609 | 8.4609 | 8.4609 | 8.4611 | 8.4832 |

TABLE 22B

Ion Fe xiii — Configuration $3p^2$
Transition $^1D_2$–$^3P_2$ — Wavelength (Å) 3388.5

−log (Intensity/$n^2N$ (Fe xiii))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.3 ...... | 8.6288 | 8.6288 | 8.6288 | 8.6288 | 8.6290 | 8.6466 |
| 6.2 ...... | 8.5824 | 8.5824 | 8.5824 | 8.5824 | 8.5825 | 8.6017 |
| 6.1 ...... | 8.5380 | 8.5380 | 8.5380 | 8.5380 | 8.5382 | 8.5588 |
| 6.0 ...... | 8.4938 | 8.4938 | 8.4938 | 8.4938 | 8.4941 | 8.5160 |

TABLE 22C

Ion Fe xiii — Configuration $3p^2$
Transition $^1S_0$–$^1D_2$ — Wavelength (Å) 2288.9

−log (Intensity/$n^2N$ (Fe xiii))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.3 ...... | 11.2373 | 11.2373 | 11.2373 | 11.2373 | 11.2362 | 11.1539 |
| 6.2 ...... | 11.1937 | 11.1937 | 11.1937 | 11.1937 | 11.1925 | 11.1017 |
| 6.1 ...... | 11.1528 | 11.1528 | 11.1528 | 11.1528 | 11.1514 | 11.0518 |
| 6.0 ...... | 11.1129 | 11.1129 | 11.1129 | 11.1129 | 11.1114 | 11.0018 |

TABLE 22D

Ion Fe xiii — Configuration $3p^2$
Transition $^1S_0$–$^3P_1$ — Wavelength (Å) 1213.0

−log (Intensity/$n^2N$ (Fe xiii))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.3 ...... | 8.8646 | 8.8646 | 8.8646 | 8.8646 | 8.8636 | 8.7812 |
| 6.2 ...... | 8.8210 | 8.8210 | 8.8210 | 8.8210 | 8.8198 | 8.7290 |
| 6.1 ...... | 8.7801 | 8.7801 | 8.7801 | 8.7800 | 8.7787 | 8.6791 |
| 6.0 ...... | 8.7402 | 8.7402 | 8.7402 | 8.7402 | 8.7388 | 8.6293 |

TABLE 23

Ion C ii — Configuration $2p$
Transition $^2P_{3/2}$–$^2P_{1/2}$ — Wavelength (Å) $1.56 \times 10^6$

−log (Intensity/$n^2N$ (C ii))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 4.8 ...... | 7.5566 | 7.9689 | 9.7636 | 11.7609 | 13.7609 | 15.7609 |
| 4.4 ...... | 7.3652 | 7.9048 | 9.7630 | 11.7613 | 13.7613 | 15.7613 |
| 4.1 ...... | 7.2357 | 7.8716 | 9.7630 | 11.7618 | 13.7618 | 15.7618 |
| 4.0 ...... | 7.2014 | 7.8641 | 9.7632 | 11.7621 | 13.7621 | 15.7621 |
| 3.7 ...... | 7.1511 | 7.8547 | 9.7646 | 11.7634 | 13.7634 | 15.7634 |

TABLE 24

Ion N iii — Configuration $2p$
Transition $^2P_{3/2}$–$^2P_{1/2}$ — Wavelength (Å) $5.729 \times 10^5$

−log (Intensity/$n^2N$ (N iii))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 5.1 ...... | 7.8783 | 7.8970 | 8.6123 | 10.5249 | 12.5239 | 14.5238 |
| 4.6 ...... | 7.6331 | 7.6654 | 8.5770 | 10.5251 | 12.5246 | 14.5246 |
| 4.1 ...... | 7.4065 | 7.4596 | 8.5582 | 10.5268 | 12.5265 | 14.5265 |
| 4.0 ...... | 7.3724 | 7.4299 | 8.5566 | 10.5276 | 12.5273 | 14.5273 |
| 3.7 ...... | 7.3270 | 7.3909 | 8.5572 | 10.5313 | 12.5310 | 14.5310 |

TABLE 25

Ion O iv — Configuration $2p$
Transition $^2P_{3/2}$–$^2P_{1/2}$ — Wavelength (Å) $2.587 \times 10^5$

−log (Intensity/$n^2N$ (O iv))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 5.4 ...... | 7.0553 | 7.0561 | 7.1393 | 8.4045 | 10.3849 | 12.3847 |
| 4.9 ...... | 6.8082 | 6.8098 | 6.9473 | 8.3968 | 10.3856 | 12.3855 |
| 4.4 ...... | 6.5692 | 6.5720 | 6.7887 | 8.3943 | 10.3877 | 12.3877 |
| 4.0 ...... | 6.4123 | 6.4165 | 6.7036 | 8.3972 | 10.3927 | 12.3927 |
| 3.8 ...... | 6.3785 | 6.3830 | 6.6891 | 8.4017 | 10.3976 | 12.3976 |
| 3.7 ...... | 6.3800 | 6.3845 | 6.6917 | 8.4052 | 10.4011 | 12.4011 |

TABLE 26

Ion Ne ii — Configuration $2p^5$
Transition $^2P_{1/2}$–$^2P_{3/2}$ — Wavelength (Å) $1.278 \times 10^5$

−log (Intensity/$n^2N$ (Ne ii))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 5.0 ...... | 8.1713 | 8.1714 | 8.1740 | 8.3794 | 9.9669 | 11.9600 |
| 4.6 ...... | 7.9813 | 7.9813 | 7.9856 | 8.2740 | 9.9692 | 11.9649 |
| 4.2 ...... | 7.8093 | 7.8094 | 7.8156 | 8.2024 | 9.9804 | 11.9774 |
| 4.0 ...... | 7.7487 | 7.7488 | 7.7562 | 8.1868 | 9.9922 | 11.9898 |
| 3.7 ...... | 7.7409 | 7.7409 | 7.7491 | 8.2059 | 10.0260 | 12.0237 |

TABLE 27

ION Ne VI CONFIGURATION $2p$
TRANSITION $^2P_{3/2}$–$^2P_{1/2}$ WAVELENGTH (Å) 76320.0

−log (INTENSITY/$n^2N$ (Ne VI))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 5.8 ...... | 7.7926 | 7.7926 | 7.7934 | 7.8665 | 9.0835 | 11.0606 |
| 5.7 ...... | 7.7432 | 7.7432 | 7.7441 | 7.8251 | 9.0811 | 11.0609 |
| 5.5 ...... | 7.6440 | 7.6440 | 7.6451 | 7.7448 | 9.0775 | 11.0613 |
| 5.4 ...... | 7.5948 | 7.5948 | 7.5960 | 7.7063 | 9.0758 | 11.0614 |
| 4.5 ...... | 7.1708 | 7.1708 | 7.1742 | 7.4239 | 9.0744 | 11.0691 |
| 4.0 ...... | 7.0069 | 7.0069 | 7.0121 | 7.3510 | 9.0927 | 11.0891 |
| 3.7 ...... | 7.0316 | 7.0318 | 7.0370 | 7.3799 | 9.1248 | 11.1215 |

TABLE 28

ION Mg IV CONFIGURATION $2p^5$
TRANSITION $^2P_{1/2}$–$^2P_{3/2}$ WAVELENGTH (Å) 44911.0

−log (INTENSITY/$n^2N$ (Mg IV))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 5.6 ...... | 8.4355 | 8.4355 | 8.4358 | 8.4426 | 8.8556 | 10.6506 |
| 5.0 ...... | 8.1461 | 8.1461 | 8.1462 | 8.1599 | 8.7722 | 10.6563 |
| 4.4 ...... | 7.8924 | 7.8924 | 7.8926 | 7.9184 | 8.7485 | 10.6838 |
| 4.0 ...... | 7.8044 | 7.8044 | 7.8048 | 7.8405 | 8.7902 | 10.7432 |
| 3.8 ...... | 7.8378 | 7.8378 | 7.8382 | 7.8762 | 8.8484 | 10.8043 |

TABLE 29

ION Mg VIII CONFIGURATION $2p$
TRANSITION $^2P_{3/2}$–$^2P_{1/2}$ WAVELENGTH (Å) 30258.0

−log (INTENSITY/$n^2N$ (Mg VIII))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.2 ...... | 8.4365 | 8.4365 | 8.4365 | 8:4377 | 8.5625 | 9.9768 |
| 6.1 ...... | 8.3875 | 8.3875 | 8.3875 | 8.3891 | 8.5265 | 9.9757 |
| 5.9 ...... | 8.2883 | 8.2883 | 8.2883 | 8.2904 | 8.4568 | 9.9737 |
| 5.8 ...... | 8.2386 | 8.2386 | 8.2387 | 8.2410 | 8.4240 | 9.9729 |

TABLE 30

ION Si II CONFIGURATION $3p$
TRANSITION $^2P_{3/2}$–$^2P_{1/2}$ WAVELENGTH (Å) $3.4795 \times 10^5$

−log (INTENSITY/$n^2N$ (Si II))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 4.7 ...... | 7.5026 | 7.5257 | 8.3136 | 10.2415 | 12.2407 | 14.2407 |
| 4.4 ...... | 7.3593 | 7.3908 | 8.2954 | 10.2425 | 12.2419 | 14.2419 |
| 4.1 ...... | 7.2316 | 7.2738 | 8.2846 | 10.2448 | 12.2444 | 14.2444 |
| 4.0 ...... | 7.1989 | 7.2444 | 8.2829 | 10.2459 | 12.2456 | 14.2456 |
| 3.7 ...... | 7.1605 | 7.2105 | 8.2856 | 10.2521 | 12.2518 | 14.2518 |

TABLE 31

ION Si VI CONFIGURATION $2p^5$
TRANSITION $^2P_{1/2}$–$^2P_{3/2}$ WAVELENGTH (Å) 19603.0

−log (INTENSITY/$n^2N$ (Si VI))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.0 ...... | 8.3953 | 8.3953 | 8.3953 | 8.3957 | 8.4246 | 9.2972 |
| 5.6 ...... | 8.2003 | 8.2003 | 8.2003 | 8.2007 | 8.2457 | 9.2801 |
| 5.2 ...... | 8.0121 | 8.0121 | 8.0121 | 8.0128 | 8.0814 | 9.2747 |
| 4.8 ...... | 7.8439 | 7.8439 | 7.8439 | 7.8451 | 7.9469 | 9.2871 |

TABLE 32

ION Si X CONFIGURATION $2p$
TRANSITION $^2P_{3/2}$–$^2P_{1/2}$ WAVELENGTH (Å) 14302.0

−log (INTENSITY/$n^2N$ (Si X))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.3 ...... | 8.2596 | 8.2596 | 8.2596 | 8.2596 | 8.2708 | 8.8264 |
| 6.2 ...... | 8.2099 | 8.2099 | 8.2099 | 8.2099 | 8.2227 | 8.8137 |
| 6.1 ...... | 8.1610 | 8.1610 | 8.1610 | 8.1614 | 8.1756 | 8.8022 |
| 6.0 ...... | 8.1118 | 8.1118 | 8.1118 | 8.1120 | 8.1280 | 8.7917 |

TABLE 33

ION S IV CONFIGURATION $3p$
TRANSITION $^2P_{3/2}$–$^2P_{1/2}$ WAVELENGTH (Å) $1.0521 \times 10^5$

−log (INTENSITY/$n^2N$ (S IV))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 5.3 ...... | 7.9392 | 7.9395 | 7.9534 | 8.5753 | 10.4625 | 12.4612 |
| 5.2 ...... | 7.8900 | 7.8901 | 7.9058 | 8.5645 | 10.4624 | 12.4613 |
| 5.0 ...... | 7.7924 | 7.7927 | 7.8123 | 8.5463 | 10.4630 | 12.4621 |
| 4.8 ...... | 7.6970 | 7.6973 | 7.7217 | 8.5318 | 10.4641 | 12.4633 |
| 4.2 ...... | 7.4356 | 7.4361 | 7.4806 | 8.5109 | 10.4732 | 12.4728 |
| 4.0 ...... | 7.3788 | 7.3795 | 7.4305 | 8.5136 | 10.4808 | 12.4804 |
| 3.7 ...... | 7.3810 | 7.3816 | 7.4350 | 8.5343 | 10.5031 | 12.5027 |

TABLE 34

ION S VIII CONFIGURATION $2p^5$
TRANSITION $^2P_{1/2}$–$^2P_{3/2}$ WAVELENGTH (Å) 9917.9

−log (INTENSITY/$n^2N$ (S VIII))

| log (T) | log (n) 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|---|
| 6.3 ...... | 8.6934 | 8.6934 | 8.6934 | 8.6934 | 8.6954 | 8.8562 |
| 6.1 ...... | 8.5957 | 8.5957 | 8.5957 | 8.5957 | 8.5981 | 8.7919 |
| 5.9 ...... | 8.4983 | 8.4983 | 8.4983 | 8.4983 | 8.5016 | 8.7334 |
| 5.7 ...... | 8.4031 | 8.4031 | 8.4031 | 8.4033 | 8.4071 | 8.6821 |

TABLE 35

Ion S XII — Configuration $2p$
Transition $^2P_{3/2}$–$^2P_{1/2}$ — Wavelength (Å) 7536.0

$-\log$ (Intensity/$n^2N$ (S XII))

| | log (n) | | | | | |
|---|---|---|---|---|---|---|
| log (T) | 0 | 2 | 4 | 6 | 8 | 10 |
| 6.3 ...... | 8.4465 | 8.4465 | 8.4465 | 8.4465 | 8.4476 | 8.5511 |
| 6.2 ...... | 8.3974 | 8.3974 | 8.3974 | 8.3974 | 8.3987 | 8.5130 |
| 6.1 ...... | 8.3494 | 8.3494 | 8.3494 | 8.3494 | 8.3509 | 8.4769 |
| 6.0 ...... | 8.3009 | 8.3009 | 8.3009 | 8.3009 | 8.3026 | 8.4414 |

TABLE 36

Ion Fe X — Configuration $3p^5$
Transition $^2P_{1/2}$–$^2P_{3/2}$ — Wavelength (Å) 6374.5

$-\log$ (Intensity/$n^2N$ (Fe X))

| | log (n) | | | | | |
|---|---|---|---|---|---|---|
| log (T) | 0 | 2 | 4 | 6 | 8 | 10 |
| 6.3 ...... | 8.0667 | 8.0667 | 8.0667 | 8.0667 | 8.0675 | 8.1461 |
| 6.2 ...... | 8.0177 | 8.0177 | 8.0177 | 8.0177 | 8.0188 | 8.1059 |
| 6.0 ...... | 7.9217 | 7.9217 | 7.9217 | 7.9218 | 7.9229 | 8.0298 |
| 5.8 ...... | 7.8274 | 7.8274 | 7.8274 | 7.8274 | 7.8289 | 7.9590 |

TABLE 37

Ion Fe XIV — Configuration $3p$
Transition $^2P_{3/2}$–$^2P_{1/2}$ — Wavelength (Å) 5302.9

$-\log$ (Intensity/$n^2N$ (Fe XIV))

| | log (n) | | | | | |
|---|---|---|---|---|---|---|
| log (T) | 0 | 2 | 4 | 6 | 8 | 10 |
| 6.3 ...... | 7.8530 | 7.8530 | 7.8530 | 7.8530 | 7.8536 | 7.9162 |
| 6.2 ...... | 7.8043 | 7.8043 | 7.8043 | 7.8043 | 7.8051 | 7.8745 |
| 6.1 ...... | 7.7569 | 7.7569 | 7.7569 | 7.7569 | 7.7578 | 7.8347 |
| 6.0 ...... | 7.7091 | 7.7091 | 7.7091 | 7.7091 | 7.7101 | 7.7953 |

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