

THE ZEEMAN EFFECTS IN RUTHENIUM I

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Introduction

Ruthenium is a hard, brittle, gray metal belonging to the platinum group and occurring native with the other metals of this group. The element is a member of the fifth period in the Periodic Table and has atomic number $Z = 44$. Of the fifth period triad, Ru, Rh, Pd, the most complex arc spectrum is that emitted by ruthenium. The complexity of the spectrum is due to the unclosed 4d shell of electrons which gives rise to three overlapping configurations. The configurations, d^7s , d^6s^2 , d^8 , lie in close energy correspondence to one another and hence contribute to the production of thousands of observable spectrum lines. The M.I.T. Wavelength Tables¹ list over 2800 strong ruthenium lines while McFee² has ascribed 6970 lines to the arc spectrum of ruthenium. In the card catalog compiled by the M.I.T. - W.P.A. wave-length project well over 8000 lines have been definitely assigned to this element. From a consideration of the terms arising from the three basic electron configurations and their first excited states, the author has roughly estimated that over 40,000 combinations are possible.

The first attempt at analyzing this complex spectrum was made by Kayser³ who published several interval pairs recurring in the wave-number list. In a later investiga-

tion of the wave-number system, Paulson⁴ assigned 548 arc lines to a group of 18 low levels. Of Kayser's initial attempt only two intervals (938, 601) were accepted by Paulson. Slight errors exist in the values given by both investigators because the use of wave-numbers without reduction to vacuum was made. The 18 low levels found by Paulson include almost all levels since found up to 15,060 wave-numbers. Levels not present in his list are those for which $J = 0$ or 1 and a triplet and singlet G term.

Meggers and Laporte⁵ grouped a number of under-water-spark absorption lines in multiplets, establishing the lowest term of Ru I as a probable 5D term. In a second investigation⁶ which included Zeeman effects for 9 lines (unresolved triplets), they reassigned the low term as 5F . This resulted in the classification of a number of lines into 18 multiplets involving 20 terms.

In 1925, Sommer⁷ measured the Zeeman effects of five Ru I lines to two figures after the decimal. The following year he published an article⁸ containing the classification of 920 lines arising from combinations of 113 energy levels. Of these levels he determined g values for 63. The field strength was determined from zinc impurity lines to be 29,500 oersted with a probable error of ± 0.5 percent. The experimental details provided no means of separating the different polarizations in the emitted light so that the interpretation of data was difficult.

The availability at M.I.T. of magnetic fields⁹ of

three-fold the intensity used by previous investigators made possible increased magnetic resolution and hence greater accuracy in the determinations of g values. The results of the analysis of 450 resolved patterns, including g values for 140 levels to ± 0.003 unit have been published in the Physical Review by Harrison and the present writer.¹⁰

In the present research more than 2380 spectrum lines emitted by the normal ruthenium atom have been classified. Observed Zeeman effects have been included in the Table IX. The energy system comprises 249 levels of which there are 39 low even levels, 188 middle odd levels, and 22 high even levels. L and S values¹¹ have been assigned where meaningful, although strong perturbations of neighboring levels make the assignment doubtful in a few cases.

The present work revealing the applications of Zeeman effects to the analysis of a complex spectrum might well be considered a tribute to the original investigator in this field.¹²

Experimental Procedure

A mixture of one part of ruthenium metal powder and five parts of silver powder was compressed at 20,000 lbs. per square inch to form electrodes of 1/8 inch thickness. After sintering, the electrodes were turned to round rods and pointed to permit maximum steadiness and brightness in the horizontal arc.⁹ The Bitter magnet especially designed for Zeeman effect investigations⁹ was used to produce fields in the neighborhood of 100,000 oersteds. Light from the arc taken transverse to the field was reflected longitudinally down the solenoid axis (Figure I) and separated into its two polarized components (p and n) by means of a 50-mm diameter Rochon prism. One plane-polarized beam was focused on the slit of grating H after a single reflection from a plane mirror. Because of the speed of the G grating only a small fraction of the oppositely polarized beam struck the G slit; the remainder was reflected to a concave mirror and refocused on the F slit. In this way three gratings were in simultaneous operation from the single arc source. The characteristics of these three gratings are given in Table I.

In order to photograph both p and n components on the same set of plates, the Rochon prism was rotated through 180°, thus inverting the positions of the two polarizations. A field-free exposure was taken partially overlapping the

two field exposures as shown in Figure 2. To obtain optimum magnetic resolution, the magnet current was held constant to 0.1 percent during each exposure. Currents up to 10,000 amperes were used to produce the various field intensities (Table II). These field strengths were calculated to an accuracy of ± 0.3 percent from the Zeeman patterns of the resonance lines of AgI, CuI, and CaII, which were found as impurities.

The different spectra were measured in both directions by means of an automatic comparator^{13,14} (Figure 3) which gave data from which g values were deduced to ± 0.003 unit. Typical films taken by the automatic comparator are shown in Figure 4. A few cases of badly overlapped or barely resolved patterns necessitated visual setting in order to obtain interpretable data. For many unresolved patterns of the shading intensity type the automatic comparator gave accurately the maximum intensity component. An example of this is included in Figure 4. By applying a simple linear equation to the separation of the two intensity peaks and assuming the g value most accurately known, the second g value can be obtained to almost as precise accuracy.

The enormous amount of work entailed in hand setting on so many components would have made this investigation almost impossible. With the aid of the automatic comparator this work was reduced to a minimum. Complete plates containing several spectra are now measured in less than fif-

teen minutes each, including time for shifting the comparator carriage to the various components and running each spectrum in both directions.

Discussion of Term Classifications

As has been mentioned, previous investigators²⁻⁸ have classified many of the strong lines appearing in the arc spectrum of ruthenium. The most complete classification² accounted for about 1100 spectrum lines and contained 115 energy levels. Since a greater part of the arc spectrum was still unclassified it was deemed necessary to extend this initial array of levels. Both the Zeeman effect and the Harrison interval sorter¹⁵ were utilized in furthering the classification of lines. The present analysis contains 2380 classified lines of which Zeeman effects for 600 have been observed.

The three basic electron configurations in RuI are d^7s , d^6s^2 , and d^8 , which in the excited states become d^7p , d^6sp , and d^7p , respectively. The ground state had been determined previously as a quintet F term arising from the d^7s configuration. The parent term, 4F , has been found by Meggers and Shenstone¹⁶; thus the lowest term is completely expressed as $4d^7(^4F) \cdot 5s(^5F)$. All the low even terms arising from a given electron configuration are in accordance with Hund's rule:-

| Configuration | Predicted | Observed |
|---------------|-----------|----------|
| $4d^75s$ | 5F | a^5F |
| $4d^65s^2$ | 5D | a^5D |
| $4d^8$ | 3F | b^3F |

The assignment of b^3F and b^3P , to the d^8 configuration

is based on the apparently slight configuration interaction which exists between d^8 and the other two configurations. Overlapping terms from these three configurations exhibit strong interactions between the d^7 s and the d^6s^2 values only; the interactions are carried over into the highly perturbed g values. The levels for $J = 3,4$ in the d^8 configuration show little perturbation and give an excellent example of the Pauli g sum rule.¹⁹ g sums for the various configurations have been arranged in Table V.

The totality of terms arising from the five different electrons is arranged in Table IV with completely observed terms underlined. The predominance of the $4d^75s$ and $4d^75p$ configurations has lightened the task of analysis immensely. In assigning L and S values to the levels, consideration has been given to term g values as well as to the intensity combinations. This has been very useful in the unscrambling of highly perturbed terms, as in the case¹⁰ of $a^5D_2(1.232)$ and $a^3F_2(1.089)$. Initially these term designations were interchanged but a consideration of their g values indicates the validity of their present designations. The perturbations existing in these two terms and the neighboring $a^5P_2(1.563)$ can be accounted for almost wholly as a common perturbation. A consideration of the g sums for these three terms and the slightly perturbed $b^3F_2(0.764)$ shows an almost perfect LS-coupling g sum:-

| Term | g_{LS} | g_{Meas} |
|----------|----------|------------|
| a^5P_2 | 1.833 | 1.563 |

(over)

| Term | gLS | gMeas | (cont) |
|------------|--------------|--------------|--------|
| a^5D_2 | 1.500 | 1.232 | |
| a^3F_2 | 0.667 | 1.089 | |
| b^3F_2 | <u>0.667</u> | <u>0.764</u> | |
| g sum | 4.667 | 4.648 | |
| Difference | 0.019 | | |

Thus, it is evident that the g value of a^3F_2 is most highly perturbed, whereas b^3F_2 is least perturbed.

As one moves up in the energy spectrum the recognition of L and S values becomes increasingly difficult and in many cases loses all meaning. The sharing of the L and S quantum numbers by close-lying levels completely destroys the meaning of definite quantum numbers. For this reason designations have not been assigned to many of the high odd levels. It is significant, however, that all the odd levels up to 45,500 cm^{-1} have had quantum numbers assigned to them with the exception of three questionable levels. These three levels may be from the $4d^65s(4D) \cdot 5p$ configuration from which no terms have been found. It is more probable that the levels are purely fortuitous since none shows a good Zeeman pattern.

The discovery of a high odd group of terms, $^3,^5D^0F^0G^0$, as well as high quintet and triplet F terms indicates that the second series members of both d^7s and d^7p have been established. The calculation of limits for the different series has been made with the help of Rydberg Interpolation Tables.¹⁷ Calculations indicate a limit for the d^7s

series at about 61,000 cms^{-1} and for the d^7p series at about 57,000 cms^{-1} above the ground state a^5F_5 . The difference in limits is due to a variation in the quantum defect for different type series as well as within a given series. This variation in the quantum defect is more pronounced in cases involving an s electron than a p electron. No definite conclusions can be drawn from the limits of the d^7p series because of the overlapping of these terms. In the d^7s series, however, four limits are roughly defined and they exhibit approximately the separations in the 4F ground state of RuII.¹⁶

| <u>Term</u> | <u>Limit</u> | <u>Average</u> | <u>Interval</u> | <u>RuII</u> |
|-------------|--------------|----------------|-----------------|-------------|
| 5F_5 | 61,250 | 60,850 | | |
| 3F_4 | 60,450 | | | |
| 5F_4 | 63,230 | 63,130 | 2280 | 1520 |
| 5F_3 | 63,150 | | | |
| 3F_3 | 63,020 | | | |
| 5F_2 | 63,960 | 63,840 | 710 | 970 |
| 3F_2 | 63,730 | | | |
| 5F_1 | 64,420 | | | |
| | | | 580 | 610 |

The analysis has revealed a total of 62 terms comprising 3 septets, 16 quintets, 30 triplets, and 13 singlets. In combination these terms and the numbered levels account for all intense lines except for a few at very long wavelengths. Attempts have been made to fit these lines into the array with no success.

The identification of the $^7F^0$ levels of small J value

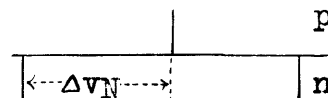
was not made until RuI was compared to FeI. Comparisons of the $3d^6 4s 4p$ of FeI and $4d^6 5s 5p$ of RuI led to the discovery of the sought-for levels within a few wave-numbers of the predicted positions. The marked similarity between the two elements as regards relative separations of terms within a given configuration is indicative of a close correspondence in the binding energy of the p electrons.

Method of Analysis

In its widest sense the Zeeman effect¹² consists in the broadening of spectrum lines emitted by a light source immersed in a magnetic field. In a uniform field, single spectrum lines split up into several components which are generally symmetrical about the zero-field position. Although the arc source ordinarily emits unpolarized light, these magnetic components are polarized. Viewed in a direction parallel to the field the light is circularly polarized, whereas when viewed in a direction perpendicular to the field the light is plane polarized. To observe all frequencies of light emitted by such a source it is necessary to view it perpendicular to the magnetic lines of force. The light consisting of vibrations parallel to the field is denoted by p, and that composed of vibrations perpendicular to the field by n.

Classical considerations of the effect of a magnetic field on a source of light lead to the following relation between the field intensity and the separation of the components:

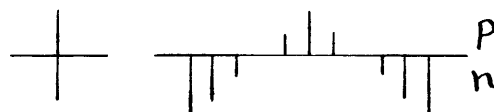
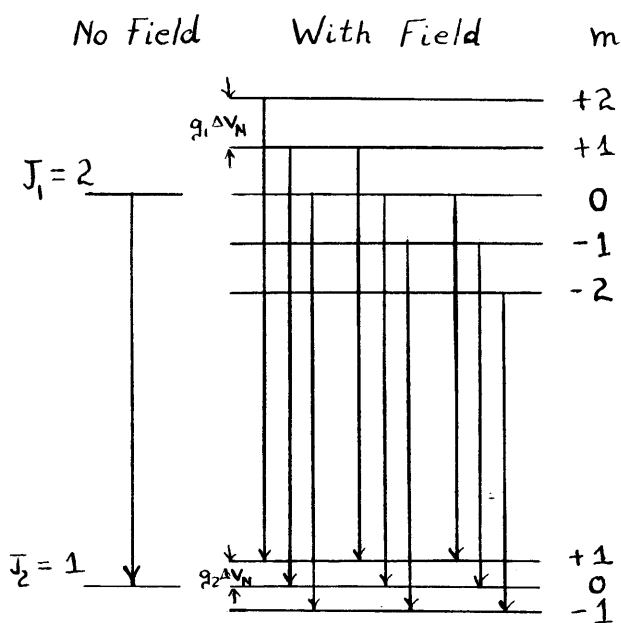
$$\Delta v_N = He/4mc^2,$$



where Δv_N is the shift in wave-numbers of the n components from the unshifted p component, H is the field intensity in oersteds, e is the electronic charge (e.s.u.), and c is the velocity of light. This equation determines the separation

in the normal triplet. The majority of spectrum lines exhibit anomalous Zeeman effects in that several p and n components occur. The magnetic field splits up each zero-field level into $(2J + 1)$ magnetic sub-levels, where J is the total inner quantum number of the particular level. The separation between these sub-levels is usually constant for a given level and is measured in units of Δv_N . The magnetic quantum number, m , which defines these sub-levels, takes all values in integral steps from $m = J$ to $m = -J$. Combinations between magnetic levels are allowed with the quantum restriction that m can change by 0 or 1. That is, $m = 0, \pm 1$, with $dm = 0$ defining the p components and $dm = \pm 1$ defining the n components.

An illustration is given here of the transition between two states $J = 2$ and $J = 1$.

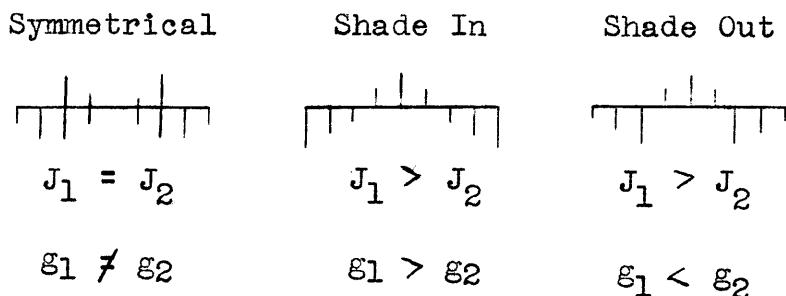


Intensity rules¹⁸ indicate that for unequal J values the strongest p component (or components) occurs for the combinations between levels of smallest m value, while the strongest n component occurs for combination between highest

m values. The equation satisfied by the strongest n component involves the J values of the two levels, that is;

$$n_{\max} = \pm(J_1g_1 - J_2g_2)\Delta\nu_N, \text{ in cms}^{-1}$$

For combinations between terms of equal J values, the strongest p components are those furthest from the zero-field position, whereas the strongest n components are found in the centers of the n groups. Less intense components occur at intervals of $(g_1 - g_2)\Delta\nu_N \text{ cms}^{-1}$. In general, three distinct types of patterns are obtainable:--symmetrical, shade in, and shade out. These types are illustrated:



In order to determine the g factor, wave-lengths need be converted to units of g. The following relations between the separation of any component from the zero-field position and the linear equation in m and g are used:

$$\Delta\nu = \Delta\lambda/\lambda^2 = (m_1g_1 - m_2g_2)eH/4 mc^2$$

$$\text{or } m_1g_1 - m_2g_2 = \Delta\lambda/4.674\lambda^2 H \times 10^{-5}.$$

The determination of H is also made by means of the latter equation. Accurately known g values must be used in order that H may be known to the desired precision.

The g values involved in the resonance lines of AgI, CuI, and CaII are exactly those expected from theoretical reasons and hence are excellent internal standards for calculating the value of H . These data have been recorded in Table III.

The precise determination of g values requires an accurate knowledge of the fundamental separation, $g_1 - g_2$. An error of 0.001 in this value may introduce an error of 0.006 in the g values of high j -valued levels for which the weak intensity components are often missing. The use of as many components as possible in this determination is therefore necessary. Partially overlapped lines are to be omitted in this calculation as they may introduce large errors. An example of a typical pattern has been worked out according to the regular method of reduction of these Zeeman patterns in Figure V.

Unresolved patterns provide nearly as good g values as the resolved type. When the term combination was known the linear equation defining the maximum intensity component was solved by assuming one g value whose magnitude was accurately known. For shade-in or shade-out patterns this method gave very consistent results due to the use of only $1/J$ of the separation of the strong component from the center of the pattern.

$$\text{i.e., } g_x = (n_{\max} \pm J_y g_y) / J_x.$$

Lines calculated in this manner have been designated by n in the Zeeman effect column of Table IX. The

assumed g value is in parentheses; the resultant g value for the second term can be seen to be consistent with the g value expected. For strongly overexposed lines this method gave insufficiently accurate g values and hence visual setting was necessitated. Unresolved symmetrical type patterns were analyzed in a similar way. The intense p components were often well enough set on by the maximum picker¹⁴ of the comparator that an accurate value of $g_1 - g_2$ could be obtained for classified lines. The n maximum intensity reading was the average intensity of the two strong n components, i.e., $\frac{1}{2}(g_1 + g_2)$. Using these two data g values were calculated.

Discussion of Results

The present analysis now explains the origin of most of the spectral energy emitted by the normal ruthenium atom. The few strong lines as yet unclassified lie in regions of the spectrum for which Zeeman data is scarce. The apparently few combinations in these regions and the generally weak nature of unclassified lines makes it difficult to discover new levels. The analysis has proved fruitful in that it more than doubled the line classification set forth by previous investigators. The averaging of energy values for such a large quadratic array is necessarily a tedious and routine job. However, as a result of this averaging process, energy values are believed to be correct to $\pm 0.01 \text{ cms}^{-1}$ for the low even terms, ± 0.02 for the middle odd terms, and ± 0.05 for the high even terms.

Table IX contains over 2380 lines definitely assigned to the energy system of RuI. More than 600 Zeeman patterns have been observed and results have been tabulated in the Zeeman effect column of Table IX. Resolved patterns have the final g values entered with g_1 corresponding to the first or lower term of the combination while g_2 corresponds to the second or higher term. The unresolved patterns fall into two types: symmetrical and shading intensity. g values have been calculated for both cases by assuming one of the term g values and solving the linear equation (see methods of analysis). Any patterns which have been thus calculated from the n component have been denoted by the letter n after the second g value; patterns calculated from g_1-g_2 only have been denoted by the

letter p. The limiting case of these two types is for nearly equal g values. This gives rise to a sharp pattern of separation approximately that of the actual g values. In general, such patterns have been given to only two figures after the decimal. Patterns involving a level with $J = 0$ give directly the g value of the other level. The combination between a 5F_1 ($g = 0.000$) and a level with $J = 0$ shows no magnetic splitting whatsoever. An example of this type of combination is included in Figure 4.

Zeeman effects for 173 of the 249 observed levels have been determined. Only four of these, including three for high even levels, have been given to two figures after the decimal. The remaining 169 determinations are believed to be consistent to ± 0.002 unit or better.

Table IV contains a list of terms predicted from the various electron configurations. Completely observed terms are underlined. The ground state arises from the $4d^7({}^4F) \cdot 5s$ configuration. About 7500 wavenumbers above the ground state, 5F_5 , the sole term found from the $4d^65s^2$ configuration occurs; this is the 5D term. Overlapping the 5D is a 3F from the parent 4F of d^7s and a quintet and triplet P term from the parent 4P also of d^7s . The overlapping of these four terms gives rise to interactions and highly perturbed g values. The d^8 configuration comes in at about 9100 wave-numbers and shows only slightly perturbed g values. This latter configuration is complete except for the term 1S_0 , which is probably quite high in the energy spectrum.

In the odd group the predominant configuration is based

on the $4d^7$ shell with a loosely bound p electron. Because of the generally weak combinations between d^7s and d^6sp , and at most only three possible combinations with the low d^6s^2 , the majority of the d^6sp levels were found by means of Zeeman effects. No levels based on the parent 4D from this configuration were found indicating that most of the energy is concentrated in the transitions involving the change of a p electron to an s electron, i.e., $d^7p \rightarrow d^7s$. By comparison with $RuII^{16}$ in which the splitting between sextet and quartet D terms is about $9,000 \text{ cm}^{-1}$, one should expect the terms based on the quartet D to come in above $40,000 \text{ cm}^{-1}$. The series members, $^3,^5F^0, D^0$, combine much too strongly with d^7s to be considered as due to $(^4D) \cdot p$. The added presence of the triplet and quintet G^0 terms substantiates the assignment of these terms to series members.

The high even terms do not show many combinations except for the group $e^3,^5F$ which picks out many of the strongly hazy infra-red lines. The remaining high even terms are based on weaker lines and show anomalous intensities. Although they are quite high the latter may arise from d^6s^2 as there appear to be D, F, G, type terms present.

In many cases the L nature of a level was obvious whereas no S value seemed appropriate. The further study of several levels in the odd group unfolded a septet F term which had been partially identified as a quintet F term. In the low even terms, b^3D_2 was changed to a^1D_2 .

The real test of the application of Zeeman effects in unravelling complex spectra is in the verification of the

Pauli g sum rule.¹⁹ The rule states that out of all the levels arising from a given electron configuration the sum of the g factors for levels with the same J value is a constant independent of the coupling scheme. Due to interacting configurations this rule may not apply except in a few isolated cases. However, when one considers configuration sums the perturbations are seen to be accounted for and Pauli's sum rule is strictly applicable. Table V includes the g sums for the individual configurations as well as total configurations. The remarkability of the validity of Pauli's rule for the total g sums in the low even configurations (maximum difference of 0.008 unit) indicates that other members of the even configurations lie sufficiently higher in energy so as not to interact with the present identified terms. Term 42_2 ($g = 1.343$) is probably the $d^7s(3P_2)$ term interacting with the undiscovered $d^7(2F) \cdot s(3F_2)$ or $d^7(2P) \cdot s(1D_2)$ terms.

The d^8 configuration shows g sums for $J = 4$ (2.247 vs. 2.250 LS) and for $J = 3$ (1.086 vs. 1.083 LS). Terms with J of 2 and 1 interact slightly with a^3F_2 and a^3D_1 , respectively. For a ready comparison, the total g sums for the even terms are repeated here:

| <u>J</u> | <u>gMeas</u> | <u>gLS</u> | <u>Diff.</u> |
|----------|--------------|------------|--------------|
| 6 | 1.164 | 1.167 | -0.003* |
| 5 | 4.635 | 4.633 | +0.002* |
| 4 | 8.194 | 8.200 | -0.006* |
| 3 | 8.665 | 8.666 | -0.001* |
| 2 | 10.834 | 10.834 | 0.000* |
| 1 | 8.508 | 8.500 | +0.008* |

* indicates an incomplete g sum.

The verification of the g sum rule is evident, as is the added check on the field determination H. Although the sum is incomplete the fact that it checks so well indicates that all levels have been discovered in the range covered by these levels and outside of this range the levels are too distant to interact to any appreciable extent.

The g sum for the odd levels does not verify the sum rule. However, there is a large number of numbered levels which lie in the range covered by these terms used in the g sum. Over small ranges the perturbations in the g values of several close-lying terms are found to be consistent with the g sum for the terms involved. Total g sums, though incomplete, do show a tendency to follow the Pauli rule with an LS coupling scheme. Four of the seven g sums are in variance with the rule and hence undiscovered terms probably lie in the range covered by the g sum. There are several terms for which no g values were determined and these may absorb the discrepancy between observed and calculated. For comparison:

| <u>J</u> | <u>gMeas</u> | <u>gLS</u> | <u>Diff.</u> | |
|----------|--------------|------------|--------------|----------------------------------|
| 7 | 1.146 | 1.143 | +0.003* | |
| 6 | 7.410 | 7.524 | -0.114* | |
| 5 | 18.261 | 18.333 | -0.072* | |
| 4 | 24.180 | 24.450 | -0.270* | |
| 3 | 33.935 | 33.915 | +0.020* | * indicates an incomplete g sum. |
| 2 | 36.207 | 36.002 | +0.205* | |
| 1 | 23.006 | 23.000 | +0.006* | |

Zeeman effects have been used extensively in the analysis of this spectrum. They are an invaluable tool for routing out

obscure levels and giving additional certainty in the analysis. The discovery of level $z^3I_7^0$, which has only one possible combination, succumbed to the analysis by means of the Zeeman effect. The expected combination $a^3H_6 - z^3I_7^0$ should be found in an intense line with an n_{\max} separation of $7g_7 - 6g_6$ or 1.017 (assuming that $z^3I_7^0$ has the theoretical LS g value of 1.143 and that $g_6 = 1.164$). An unclassified line 3742.784A of intensity 50, 50 gives a shade out pattern with maximum separation 1.038 units. Computing a g value for $z^3I_7^0$ one obtains $g = 1.146$. Thus, with the substantiating Zeeman pattern this line is now definitely classified.

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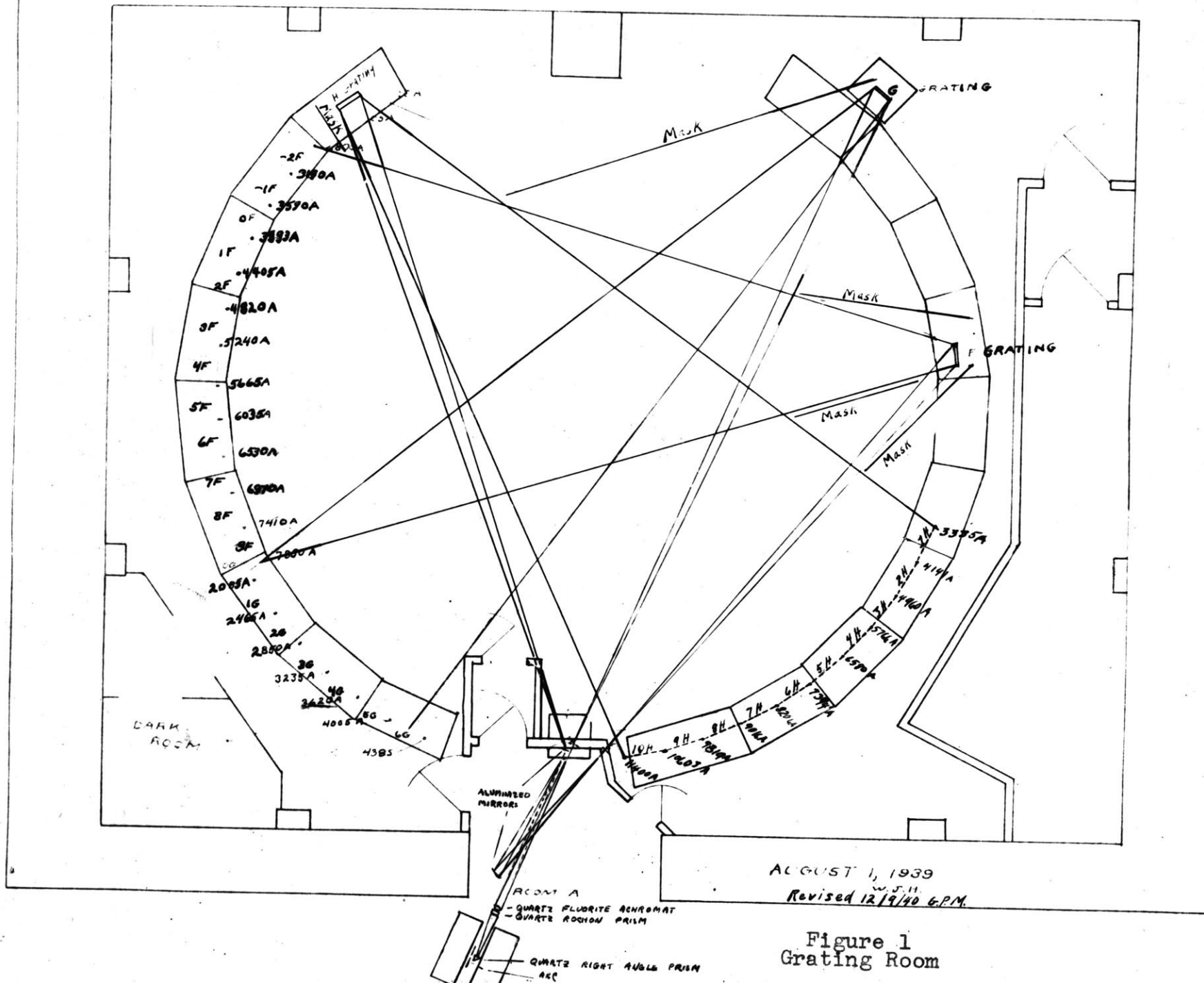
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References

1. M.I.T. Wavelength Tables, John Wiley and Sons, New York (1939).
2. R.H. McFee, unpublished M.Sc. Thesis, M.I.T.(1938).
3. H. Kayser, "Über die Bogenspektren der Elemente der Platingruppe," Abhandl. d. Berl. Akad.(1897).
4. Emil Paulson, Physik. Zeits. 16, 81(1915).
5. W.F. Meggers and Otto Laporte, Science 61, 635(1925).
6. W.F. Meggers and Otto Laporte, J. Wash. Acad. Sci. 16, 143(1926).
7. L.A. Sommer, Naturwiss. 13, 840(1925).
8. L.A. Sommer, Zeits. f. Physik. 37, 1(1926).
9. G.R. Harrison and F. Bitter, Phys. Rev. 57, 15(1940).
10. G.R. Harrison and J.R. McNally, Jr., Phys. Rev. 58, 703 (1940).
11. Russell, Shenstone, and Turner, Phys. Rev. 33, 900(1929).
12. P. Zeeman, "Over den invloed eener magnetisatie op den aard van het door een stof uitgestraalde licht," Zittingsverslag, Akademie Amsterdam 5, 43, 226(1897).
13. G.R. Harrison, J. Opt. Soc. Am. 25, 169(1935); Rev. Sci. Inst. 9, 15(1938).
14. G.R. Harrison and J.P. Molnar, J. Opt. Soc. Am. 30, 343 (1940).
15. G.R. Harrison, J. Opt. Soc. Am. 25, 169(1935).
16. W.F. Meggers and A.G. Shenstone, Phys. Rev. 35, 868(1930).
17. A.G. Shenstone, J.C. Boyce, H.N. Russell, "Rydberg Interpolation Table," unpublished material obtainable from Princeton University Observatory.
18. Kiess and Meggers, quoted in White, "Introduction to Atomic Spectra," McGraw-Hill Book Company, Inc., New York.
19. W. Pauli, Zeits. f. Physik. 16, 155(1923).

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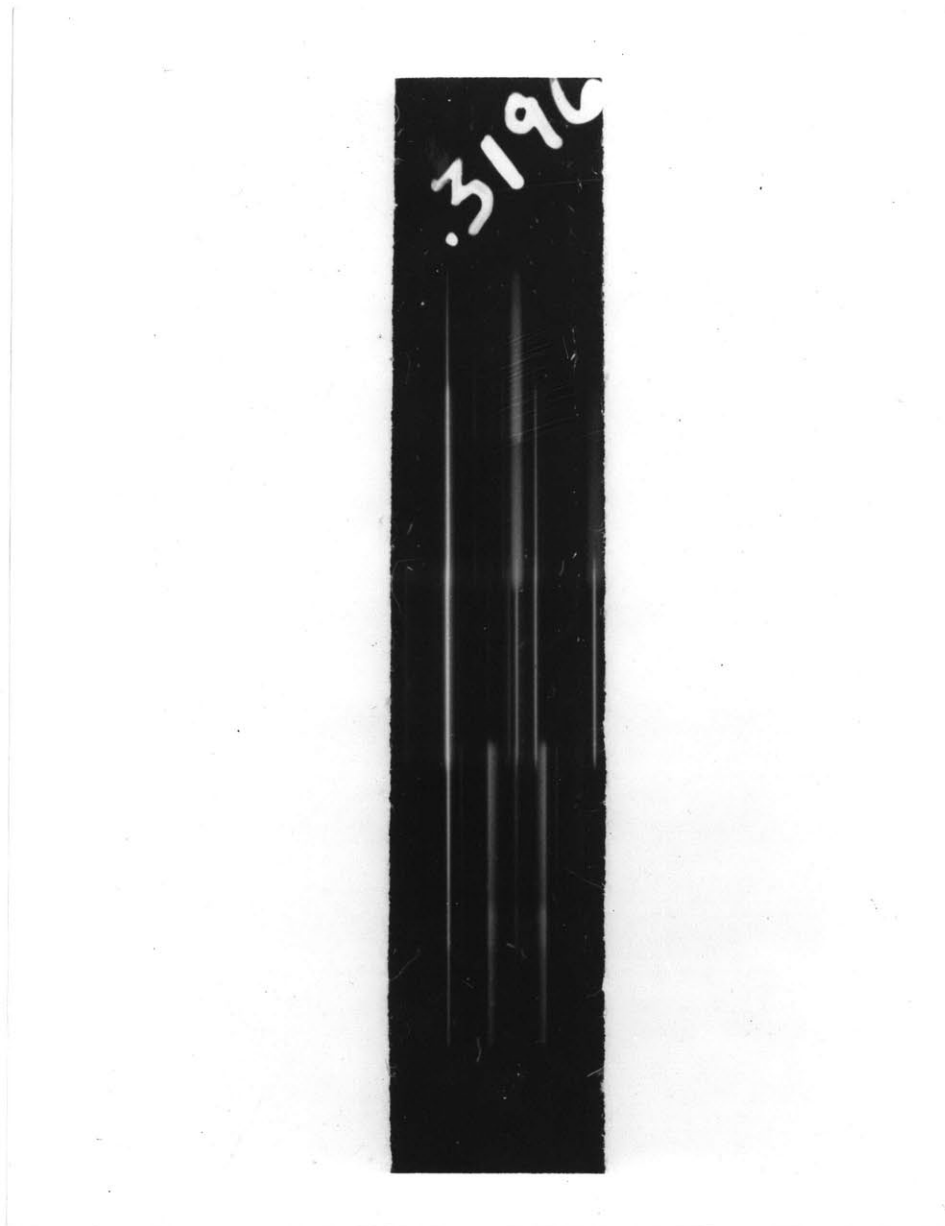


Figure 2-a. Photograph of Zeeman pattern showing no magnetic splitting. The line is 3196.591 (50,2) classified as $a^5F_1 - y^5D_0^0$. The p component is at the top, zero-field line in center and n component in the bottom exposure. Set number Z-49.

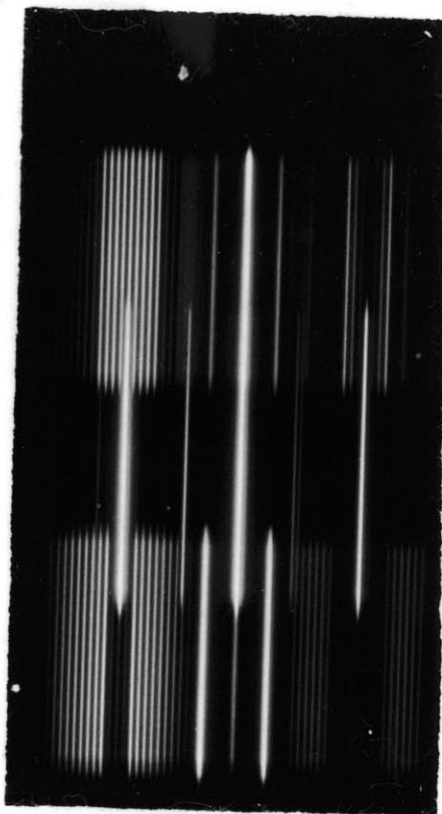


Figure 2-b. Typical Zeeman patterns obtained with Bitter Magnet. Set number Z-74 with field of 88,040 oersteds for p exposure (top), zero-field exposure in center, and a field of 89,310 oersteds for n exposure (bottom). Shade-out pattern at left is 3925.925A (60,100), $a^5F_5 - Z^7D_4^0$, $g_1 = 1.397$, $g_2 = 1.625$. Unresolved pattern in center is 3923.467A (60,100), $a^3G_4 - Z^3H_5^0$, $g_1 = 1.033$ assumed, $g_2 = 1.047$ calculated. Symmetrical pattern is 3920.915A (20,20) $a^5D_3 - Z^5P_3^0$, $g_1 = 1.423$, $g_2 = 1.650$.

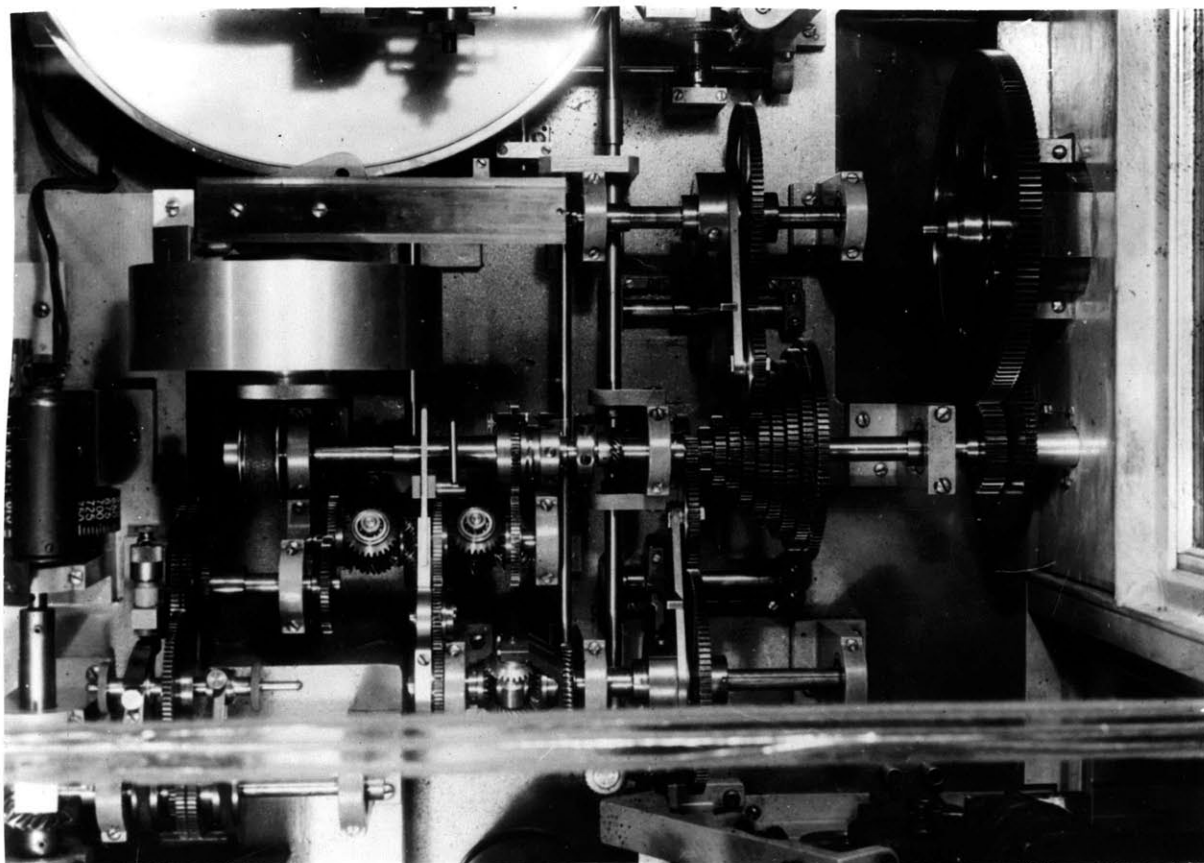


Figure 3. Photograph of the driving mechanism of the automatic comparator. At the left center is the wavelength dial while in the lower right is the camera by means of which intensity traces are obtained. The center portion of the photograph is the gearing for introducing the various dispersion corrections in the main drive shaft at the right.

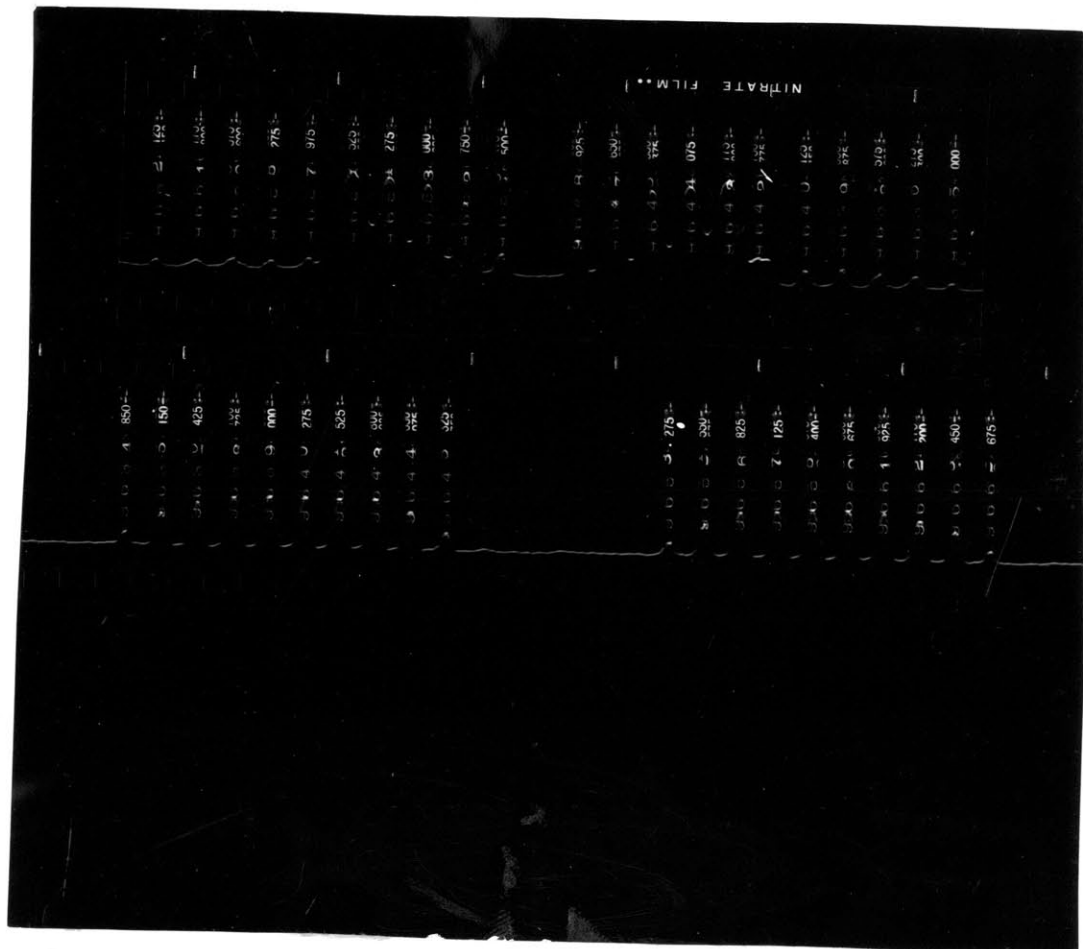


Figure 4-a. Typical film taken from automatic comparator. Photograph illustrates the actual wavelength of each component. Pattern is that of 3964.896 (50,40), $a^5F_5 - Z^7D_5^0$, $g_1 = 1.397$, $g_2 = 1.594$.

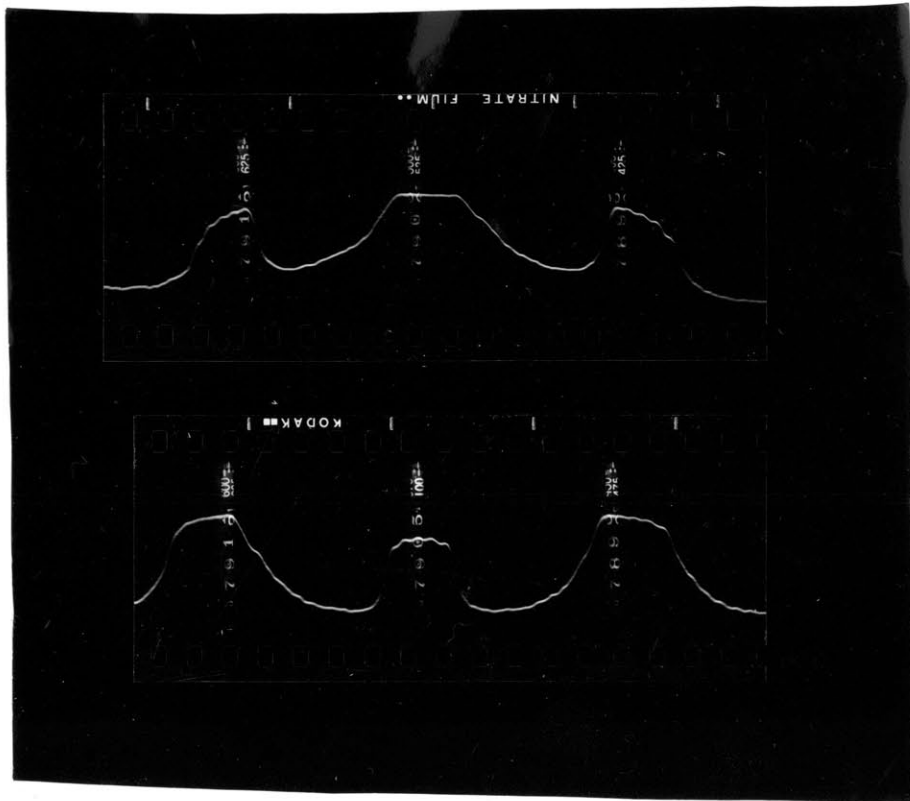


Figure 4-b. Photograph of film taken from automatic comparator. The photograph illustrates the "picking" of the maximum intensity component. Line is $3790.513 (70,150)$, $a^5F_3 - Z^5D_2^0$, $g_1 = 1.248$, $g_2 = 1.317$.

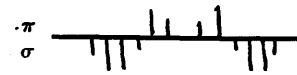
| | | | | | | | | | |
|----------------------------------|-----------------|---------------------------|---------------|------------|-----------------|---|----------------------|--------------|------------|
| 4319.869 | 5359 | 2422 | 12980 | 3 | π |  | 23142.20 | | |
| Wavelength | $1/\lambda^2$ | K | K/λ^2 | Pattern | σ | | Wavenumber M | | |
| RuI | 20,40 | $\alpha^5P_2 - z^5S_2$ | | 6G | Z-49 | | | | |
| Element | Intensity | Classification | | Plate No. | Run No. | | Wavenumber C | | |
| π | $\Delta\lambda$ | $\bar{\Delta\lambda}$ | Δa | σ | $\Delta\lambda$ | $\bar{\Delta\lambda}$ | Δa | N Δg | g_1 |
| 1 4320.580 | 0.723 | 0.722 | 0.937 | 1 4321.809 | 1.925 | 1.925 $\frac{1}{2}$ | 2.499 ⁽¹⁾ | 0.468 | 2.031 |
| 2 20.216 | 0.359 | 0.360 $\frac{1}{2}$ | 0.468 | 2 21.446 | 1.562 | 1.564 | 2.030 ⁽²⁾ | — | 2.030 |
| 3 | | | | 3 21.089 | 1.205 | 1.205 | 1.564 ⁽³⁾ | 0.468 | 2.032 |
| 4 19.495 | 0.362 | $3\Delta g = 1.405$ | | 4 20.729 | 0.845 | 0.842 $\frac{1}{2}$ | 1.094 ⁽⁴⁾ | 0.936 | 2.030 |
| 5 19.136 | 0.721 | $\Delta g = 0.468$ | | 5 | | | | | |
| 6 | | | | 6 19.044 | 0.840 | | | | |
| 7 | | | | 7 18.679 | 1.205 | | | | |
| π center | 19.857 | σ center | 19.884 | 8 18.318 | 1.566 | | | | |
| $\lambda - \bar{\lambda}$ | +0.012 | $\lambda - \bar{\lambda}$ | -0.015 | 9 17.958 | 1.926 | | | | |
| $\pi \cdot \Delta g$ | 0.468 | $\sigma \cdot \Delta g$ | 0.468 | 10 | | 1-3 | 0.935 | | |
| Adopt | 0.468 | | | 11 | | 2-4 | 0.936 | | |
| | | | | 12 | | $4\Delta g = 1.871$ | | | |
| | | | | 13 | | $\Delta g = 0.468$ | | | |
| J ₁ | 2 | J ₂ | 2 | 14 | | | | | |
| g_1 | 1.563 | g_2 | 2.031 | Field | | | | | Mean 2.031 |
| M.I.T. Zeeman Effect Card. 20M41 | | | | | | | | | |

Figure 5
Analysis of a Typical Pattern

Table I
Characteristics of Grating Spectrographs

| <u>Grating</u> | <u>Lines per in.</u> | <u>Spectrum Range A</u> | <u>Order</u> | <u>Dispersion A/mm</u> |
|----------------|----------------------|-------------------------|--------------|------------------------|
| F | 30,000 | 3190-4400 | 1 | 0.8 |
| | | 2200-3045 | 2 | 0.4 |
| G | 30,000 | 2085-4400 | 1 | 0.8 |
| H | 15,000 | 3335-11400 | 1 | 1.6 |
| | | 4103-5700 | 2 | 0.8 |

Table II
Field Intensities

| <u>Set Number</u> | <u>Field(gauss)</u> |
|------------------------|---------------------|
| Z-33a | 92,200 |
| Z-33b | 71,260 |
| Z-49 | 88,350 |
| Z-74, p on F,G; n on H | 88,040 |
| n on F,G; p on H | 89,310 |

Table III
Impurity Lines Used To Calculate Fields

| <u>Element</u> | <u>Wave-length</u> | <u>i_1</u> | <u>g_1</u> | <u>i_2</u> | <u>g_2</u> |
|----------------|--------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| CuI | 3247.540A | 1/2 | 2.000 | 3/2 | 1.333 |
| CuI | 3273.962 | 1/2 | 2.000 | 1/2 | 0.666 |
| AgI | 3280.683 | 1/2 | 2.000 | 3/2 | 1.333 |
| AgI | 3382.891 | 1/2 | 2.000 | 1/2 | 0.666 |
| CaII | 3933.666 | 1/2 | 2.000 | 3/2 | 1.333 |
| CaII | 3968.468 | 1/2 | 2.000 | 1/2 | 0.666 |

Table V

Tables of g Sums

Configuration 4d⁷5s:

| J = 6 | | | J = 5 | | |
|-------------------------------|--------------|--------------|-------------------------------|--------------|--------------|
| Term | gMeas. | gLS | Term | gMeas | gLS |
| a ³ H ₆ | <u>1.164</u> | <u>1.167</u> | a ⁵ F ₅ | 1.397 | 1.400 |
| gSum | 1.164 | 1.167 | a ³ G ₅ | 1.190 | 1.200 |
| | | | a ³ H ₅ | 1.041 | 1.033 |
| | | | a ¹ H ₅ | <u>1.007</u> | <u>1.000</u> |
| | | | gSum | 4.635 | 4.633 |
| J = 4 | | | J = 3 | | |
| Term | gMeas | gLS | Term | gMeas | gLS |
| a ⁵ F ₄ | 1.349 | 1.350 | a ⁵ F ₃ | 1.249 | 1.250 |
| a ³ F ₄ | 1.284 | 1.250 | a ³ F ₃ | 1.196 | 1.083 |
| a ³ G ₄ | 1.033 | 1.050 | a ⁵ P ₃ | 1.624 | 1.667 |
| a ³ H ₄ | <u>0.834</u> | <u>0.800</u> | a ³ G ₃ | 0.757 | 0.750 |
| gSum | 4.500 | 4.450* | a ³ D ₃ | <u>1.333</u> | <u>1.333</u> |
| | | | gSum | 6.159 | 6.083* |
| J = 2 | | | J = 1 | | |
| Term | gMeas | gLS | Term | gMeas | gLS |
| a ⁵ F ₂ | 1.000 | 1.000 | a ⁵ F ₁ | 0.000 | 0.000 |
| a ⁵ P ₂ | 1.563 | 1.833 | a ⁵ P ₁ | 1.985 | 2.500 |
| a ³ F ₂ | 1.089 | 0.667 | a ³ P ₁ | 1.684 | 1.500 |
| a ³ P ₂ | 1.534 | 1.500 | a ³ D ₁ | 0.676 | 0.500 |
| a ³ D ₂ | <u>1.162</u> | <u>1.167</u> | a ¹ P ₁ | <u>0.927</u> | <u>1.000</u> |
| gSum | 6.348 | 6.167* | gSum | 5.272 | 5.500* |

* indicates incomplete g sum. The greatest source of variation in the g sum is configuration interaction.

Configuration $4d^6 5s^2$:

| J = 4 | | |
|-------------|--------------|------------|
| <u>Term</u> | <u>gMeas</u> | <u>gLS</u> |
| a^5D_4 | 1.447 | 1.500* |

| J = 3 | | |
|-------------|--------------|------------|
| <u>Term</u> | <u>gMeas</u> | <u>gLS</u> |
| a^5D_3 | 1.420 | 1.500* |

| J = 2 | | |
|-------------|--------------|------------|
| <u>Term</u> | <u>gMeas</u> | <u>gLS</u> |
| a^5D_2 | 1.232 | 1.500* |

| J = 1 | | |
|-------------|--------------|------------|
| <u>Term</u> | <u>gMeas</u> | <u>gLS</u> |
| a^5D_1 | 1.795 | 1.500* |

Configuration $4d^8$:

| J = 4 | | |
|-------------|--------------|--------------|
| <u>Term</u> | <u>gMeas</u> | <u>gLS</u> |
| b^3F_4 | 1.255 | 1.250 |
| a^1G_4 | <u>0.992</u> | <u>1.000</u> |
| gSum | 2.247 | 2.250 |

| J = 3 | | |
|-------------|--------------|--------------|
| <u>Term</u> | <u>gMeas</u> | <u>gLS</u> |
| b^3F_3 | <u>1.086</u> | <u>1.083</u> |
| gSum | 1.086 | 1.083 |

| J = 2 | | |
|-------------|--------------|--------------|
| <u>Term</u> | <u>gMeas</u> | <u>gLS</u> |
| b^3F_2 | 0.764 | 0.667 |
| b^3P_2 | 1.315 | 1.500 |
| a^1D_2 | <u>1.175</u> | <u>1.000</u> |
| gSum | 3.254 | 3.167 |

| J = 1 | | |
|-------------|--------------|--------------|
| <u>Term</u> | <u>gMeas</u> | <u>gLS</u> |
| b^3P_1 | <u>1.441</u> | <u>1.500</u> |
| gSum | 1.441 | 1.500 |

Total g sums for even configurations:

| J = 6 | | | J = 5 | | |
|--------------------|--------------|--------------|--------------------|--------------|--------------|
| <u>Config</u> | <u>gMeas</u> | <u>gLS</u> | <u>Config</u> | <u>gMeas</u> | <u>gLS</u> |
| 4d ⁷ 5s | <u>1.164</u> | <u>1.167</u> | 4d ⁷ 5s | <u>4.635</u> | <u>4.633</u> |
| gSUM | 1.164 | 1.167 | gSUM | 4.635 | 4.633 |

| J = 4 | | | J = 3 | | |
|---------------------------------|--------------|--------------|---------------------------------|--------------|--------------|
| <u>Config</u> | <u>gMeas</u> | <u>gLS</u> | <u>Config</u> | <u>gMeas</u> | <u>gLS</u> |
| 4d ⁷ 5s | 4.500 | 4.450* | 4d ⁷ 5s | 6.159 | 6.083* |
| 4d ⁶ 5s ² | 1.447 | 1.500* | 4d ⁶ 5s ² | 1.420 | 1.500* |
| 4d ⁸ | <u>2.247</u> | <u>2.250</u> | 4d ⁸ | <u>1.086</u> | <u>1.083</u> |
| gSUM | 8.194 | 8.200* | gSUM | 8.665 | 8.666* |

| J = 2 | | | J = 1 | | |
|---------------------------------|--------------|--------------|---------------------------------|--------------|--------------|
| <u>Config</u> | <u>gMeas</u> | <u>gLS</u> | <u>Config</u> | <u>gMeas</u> | <u>gLS</u> |
| 4d ⁷ 5s | 6.348 | 6.167* | 4d ⁷ 5s | 5.272 | 5.500* |
| 4d ⁶ 5s ² | 1.232 | 1.500* | 4d ⁶ 5s ² | 1.795 | 1.500* |
| 4d ⁸ | <u>3.254</u> | <u>3.167</u> | 4d ⁸ | <u>1.441</u> | <u>1.500</u> |
| gSUM | 10.834 | 10.834* | gSUM | 8.508 | 8.500* |

* indicates incomplete g sum.

Configuration 4d⁶5s5p:

| J = 6 | | |
|--|--------------|--------------|
| <u>Term</u> | <u>gMeas</u> | <u>gLS</u> |
| z ⁷ F ₆ ⁰ | <u>1.462</u> | <u>1.500</u> |
| gSum | 1.462 | 1.500* |

| J = 4 | | |
|--|--------------|--------------|
| <u>Term</u> | <u>gMeas</u> | <u>gLS</u> |
| z ⁷ D ₄ ⁰ | 1.625 | 1.650 |
| z ⁷ F ₄ ⁰ | 1.370 | 1.500 |
| z ⁷ P ₄ ⁰ | 1.656 | 1.750 |
| y ⁵ D ₄ ⁰ | 1.492 | 1.500 |
| y ⁵ F ₄ ⁰ | <u>1.364</u> | <u>1.350</u> |
| gSum | 7.507 | 7.750* |

| J = 2 | | |
|--|--------------|--------------|
| <u>Term</u> | <u>gMeas</u> | <u>gLS</u> |
| z ⁷ D ₂ ⁰ | 1.992 | 2.000 |
| z ⁷ F ₂ ⁰ | 1.497 | 1.500 |
| z ⁷ P ₂ ⁰ | 2.059 | 2.333 |
| y ⁵ D ₂ ⁰ | 1.477 | 1.500 |
| z ⁵ P ₂ ⁰ | 1.808 | 1.833 |
| y ⁵ F ₂ ⁰ | <u>1.069</u> | <u>1.000</u> |
| gSum | 9.902 | 10.166* |

| J = 5 | | |
|--|--------------|--------------|
| <u>Term</u> | <u>gMeas</u> | <u>gLS</u> |
| z ⁷ D ₅ ⁰ | 1.592 | 1.600 |
| z ⁷ F ₅ ⁰ | 1.474 | 1.500 |
| y ⁵ F ₅ ⁰ | <u>1.402</u> | <u>1.400</u> |
| gSum | 4.468 | 4.500* |

| J = 3 | | |
|--|--------------|--------------|
| <u>Term</u> | <u>gMeas</u> | <u>gLS</u> |
| z ⁷ D ₃ ⁰ | 1.737 | 1.750 |
| z ⁷ P ₃ ⁰ | 1.895 | 1.917 |
| y ⁵ D ₃ ⁰ | 1.496 | 1.500 |
| z ⁵ P ₃ ⁰ | 1.646 | 1.667 |
| y ⁵ F ₃ ⁰ | <u>1.276</u> | <u>1.250</u> |
| gSum | 8.050 | 8.084* |

| J = 1 | | |
|--|--------------|--------------|
| <u>Term</u> | <u>gMeas</u> | <u>gLS</u> |
| y ⁵ D ₁ ⁰ | 1.522 | 1.500 |
| z ⁵ P ₁ ⁰ | 2.385 | 2.500 |
| y ⁵ F ₁ ⁰ | <u>0.145</u> | <u>0.000</u> |
| gSum | 4.052 | 4.000* |

* indicates incomplete
g sum.

Configuration 4d⁷5p:

| J = 7 | | |
|--|--------------|--------------|
| <u>Term</u> | <u>gMeas</u> | <u>gLS</u> |
| z ³ I ₇ ^o | <u>1.146</u> | <u>1.143</u> |
| gSum | 1.146 | 1.143 |

| J = 5 | | |
|--|--------------|--------------|
| <u>Term</u> | <u>gMeas</u> | <u>gLS</u> |
| z ⁵ F ₅ ^o | 1.394 | 1.400 |
| z ³ G ₅ ^o | 1.230 | 1.200 |
| z ⁵ G ₅ ^o | 1.263 | 1.267 |
| z ³ H ₅ ^o | 1.048 | 1.033 |
| y ³ G ₅ ^o | 1.142 | 1.200 |
| z ¹ H ₅ ^o | 1.020 | 1.000 |
| x ³ G ₅ ^o | 1.197 | 1.200 |
| z ³ I ₅ ^o | 0.861 | 0.833 |
| y ¹ H ₅ ^o | 1.033 | 1.000 |
| y ³ H ₅ ^o | <u>1.030</u> | <u>1.033</u> |
| gSum | 11.218 | 11.166* |

* indicates incomplete

g sum.

| J = 6 | | |
|--|--------------|--------------|
| <u>Term</u> | <u>gMeas</u> | <u>gLS</u> |
| z ⁵ G ₆ ^o | 1.379 | 1.333 |
| z ³ H ₆ ^o | 1.174 | 1.167 |
| z ³ I ₆ ^o | 1.013 | 1.024 |
| y ³ H ₆ ^o | <u>1.163</u> | <u>1.167</u> |
| gSum | 4.729 | 4.691* |

| J = 4 | | |
|--|--------------|--------------|
| <u>Term</u> | <u>gMeas</u> | <u>gLS</u> |
| z ⁵ D ₄ ^o | 1.486 | 1.500 |
| z ⁵ F ₄ ^o | 1.364 | 1.350 |
| z ³ F ₄ ^o | 1.276 | 1.250 |
| z ⁵ G ₄ ^o | 1.111 | 1.150 |
| x ⁵ D ₄ ^o | 1.481 | 1.500 |
| y ³ F ₄ ^o | 1.107 | 1.250 |
| x ³ F ₄ ^o | 1.115 | 1.250 |
| z ³ H ₄ ^o | 0.895 | 0.800 |
| z ¹ G ₄ ^o | 1.035 | 1.000 |
| y ³ G ₄ ^o | 1.196 | 1.050 |
| w ³ F ₄ ^o | 1.247 | 1.250 |
| y ³ H ₄ ^o | <u>0.962</u> | <u>0.800</u> |
| gSum | 14.275 | 14.150* |

| J = 3 | | | J = 2 | | |
|------------|--------------|--------------|------------|--------------|--------------|
| Term | <u>gMeas</u> | <u>gLS</u> | Term | <u>gMeas</u> | <u>gLS</u> |
| $z^5D_3^0$ | 1.425 | 1.500 | $z^5D_2^0$ | 1.324 | 1.500 |
| $z^5F_3^0$ | 1.293 | 1.250 | $z^5F_2^0$ | 1.164 | 1.000 |
| $z^5G_3^0$ | 0.944 | 0.917 | $z^5G_2^0$ | 0.375 | 0.333 |
| $z^3D_3^0$ | 1.204 | 1.333 | z^5S_2 | 2.034 | 2.000 |
| $z^3G_3^0$ | 0.868 | 0.750 | $z^3D_2^0$ | 1.032 | 1.167 |
| $z^3F_3^0$ | 1.133 | 1.083 | $z^3F_2^0$ | 1.026 | 0.667 |
| $x^5D_3^0$ | 1.426 | 1.500 | $y^3D_2^0$ | 1.173 | 1.167 |
| $y^3D_3^0$ | 1.379 | 1.333 | $z^3P_2^0$ | 1.469 | 1.500 |
| $y^5P_3^0$ | 1.631 | 1.667 | $x^5D_2^0$ | 1.442 | 1.500 |
| $y^3F_3^0$ | 0.968 | 1.083 | $y^5P_2^0$ | 1.713 | 1.833 |
| $y^3G_3^0$ | 0.890 | 0.750 | $y^3P_2^0$ | 1.299 | 1.500 |
| $x^3D_3^0$ | 1.159 | 1.333 | $y^3F_2^0$ | 0.889 | 0.667 |
| $z^1F_3^0$ | 1.137 | 1.000 | $w^3F_2^0$ | 0.887 | 0.667 |
| $w^3F_3^0$ | 1.235 | 1.083 | $w^3D_2^0$ | 1.182 | 1.167 |
| $x^3F_3^0$ | 1.286 | 1.083 | $x^3D_2^0$ | 1.007 | 1.167 |
| $w^3D_3^0$ | 1.163 | 1.333 | $x^3F_2^0$ | 1.025 | 0.667 |
| $y^1F_3^0$ | 0.995 | 1.000 | $v^3D_2^0$ | 1.158 | 1.167 |
| $x^1F_3^0$ | 0.934 | 1.000 | $z^1D_2^0$ | 1.026 | 1.000 |
| $x^3G_3^0$ | <u>0.76</u> | <u>0.750</u> | $x^3P_2^0$ | <u>1.422</u> | <u>1.500</u> |
| gSum | 21.830 | 21.748* | gSum | 22.647 | 22.169* |

* indicates incomplete
g sum.

| J = 1 | | |
|-------------|--------------|--------------|
| <u>Term</u> | <u>gMeas</u> | <u>gLS</u> |
| $z^5D_1^0$ | 0.953 | 1.500 |
| $z^3D_1^0$ | 0.522 | 0.500 |
| $y^3D_1^0$ | 0.756 | 0.500 |
| $z^3S_1^0$ | 1.566 | 2.000 |
| $y^3P_1^0$ | 1.606 | 1.500 |
| $z^1P_1^0$ | 0.965 | 1.000 |
| $y^3S_1^0$ | 1.533 | 2.000 |
| $x^3P_1^0$ | <u>1.350</u> | <u>1.500</u> |

| J = 1 | | |
|-------------|--------------|--------------|
| <u>Term</u> | <u>gMeas</u> | <u>gLS</u> |
| $z^5F_1^0$ | 0.567 | 0.000 |
| $z^3P_1^0$ | 1.311 | 1.500 |
| $x^5D_1^0$ | 1.569 | 1.500 |
| $y^5P_1^0$ | 2.315 | 2.500 |
| $x^3D_1^0$ | 0.892 | 0.500 |
| $w^3D_1^0$ | 0.810 | 0.500 |
| $v^3D_1^0$ | <u>0.800</u> | <u>0.500</u> |
| gSum | 17.515 | 17.500* |

Configuration 4d⁷6p:

| J = 6 | | |
|-------------|--------------|--------------|
| <u>Term</u> | <u>gMeas</u> | <u>gLS</u> |
| $y^5G_6^0$ | <u>1.219</u> | <u>1.333</u> |
| gSum | 1.219 | 1.333* |

| J = 5 | | |
|-------------|--------------|--------------|
| <u>Term</u> | <u>gMeas</u> | <u>gLS</u> |
| $y^5G_5^0$ | 1.272 | 1.267 |
| $x^5F_5^0$ | <u>1.303</u> | <u>1.400</u> |
| gSum | 2.575 | 2.667* |

| J = 4 | | |
|-------------|--------------|--------------|
| <u>Term</u> | <u>gMeas</u> | <u>gLS</u> |
| $w^5D_4^0$ | 1.473 | 1.500 |
| $w^3G_4^0$ | <u>0.925</u> | <u>1.050</u> |
| gSum | 2.398 | 2.550* |

| J = 3 | | |
|-------------|--------------|--------------|
| <u>Term</u> | <u>gMeas</u> | <u>gLS</u> |
| $w^5D_3^0$ | 1.449 | 1.500 |
| $x^5F_3^0$ | 1.059 | 1.250 |
| $u^3D_3^0$ | <u>1.547</u> | <u>1.333</u> |
| gSum | 4.055 | 4.083* |

| J = 2 | | |
|-------------|--------------|-----------------|
| <u>Term</u> | <u>gMeas</u> | <u>gLS</u> |
| $y^5G_2^0$ | 0.383 | 0.333 |
| $w^5D_2^0$ | 1.484 | 1.500 |
| $u^3D_2^0$ | 1.089 | 1.167 (over) |

* indicates incomplete
g sum.

| J = 2(cont.) | | |
|--|--------------|--------------|
| <u>Term</u> | <u>gMeas</u> | <u>gLS</u> |
| w ³ F ₂ ⁰ | <u>0.702</u> | <u>0.667</u> |
| gSum | 3.658 | 3.667* |

| J = 1 | | |
|--|--------------|--------------|
| <u>Term</u> | <u>gMeas</u> | <u>gLS</u> |
| u ³ D ₁ ⁰ ? | 1.115 | 0.500 |
| w ⁵ D ₁ ⁰ | <u>1.439</u> | <u>1.500</u> |
| gSum | 2.554 | 2.000* |
| or | 1.439 | 1.500** |

* indicates incomplete

g sum.

** Term u³D₁⁰ is not definite.

Total g sums for odd configurations:

| J = 7 | | |
|--------------------|--------------|--------------|
| <u>Config</u> | <u>gMeas</u> | <u>gLS</u> |
| 4d ⁷ 5p | <u>1.146</u> | <u>1.143</u> |
| g SUM | 1.146 | 1.143 |

| J = 5 | | |
|----------------------|--------------|---------------|
| <u>Config</u> | <u>gMeas</u> | <u>gLS</u> |
| 4d ⁶ 5s5p | 4.468 | 4.500* |
| 4d ⁷ 5p | 11.218 | 11.166* |
| 4d ⁷ 6p | <u>2.575</u> | <u>2.667*</u> |
| g SUM | 18.261 | 18.333* |

| J = 3 | | |
|----------------------|--------------|---------------|
| <u>Config</u> | <u>gMeas</u> | <u>gLS</u> |
| 4d ⁶ 5s5p | 8.050 | 8.084* |
| 4d ⁷ 5p | 21.830 | 21.748* |
| 4d ⁷ 6p | <u>4.055</u> | <u>4.083*</u> |
| g SUM | 33.935 | 33.915* |

| J = 1 | | |
|----------------------|--------------|---------------|
| <u>Config</u> | <u>gMeas</u> | <u>gLS</u> |
| 4d ⁶ 5s5p | 4.052 | 4.000* |
| 4d ⁷ 5p | 17.515 | 17.500* |
| 4d ⁷ 6p** | <u>1.439</u> | <u>1.500*</u> |
| g SUM | 23.006 | 23.000* |

| J = 6 | | |
|----------------------|--------------|---------------|
| <u>Config</u> | <u>gMeas</u> | <u>gLS</u> |
| 4d ⁶ 5s5p | 1.462 | 1.500* |
| 4d ⁷ 5p | 4.729 | 4.691* |
| 4d ⁷ 6p | <u>1.219</u> | <u>1.333*</u> |
| g SUM | 7.410 | 7.524* |

| J = 4 | | |
|----------------------|--------------|---------------|
| <u>Config</u> | <u>gMeas</u> | <u>gLS</u> |
| 4d ⁶ 5s5p | 7.507 | 7.750* |
| 4d ⁷ 5p | 14.275 | 14.150* |
| 4d ⁷ 6p | <u>2.398</u> | <u>2.550*</u> |
| g SUM | 24.180 | 24.450* |

| J = 2 | | |
|----------------------|--------------|---------------|
| <u>Config</u> | <u>gMeas</u> | <u>gLS</u> |
| 4d ⁶ 5s5p | 9.902 | 10.166* |
| 4d ⁷ 5p | 22.647 | 22.169* |
| 4d ⁷ 6p | <u>3.658</u> | <u>3.667*</u> |
| g SUM | 36.207 | 36.002* |

* indicates incomplete
g sum.

** indicates a doubtful
term omitted.

Table VI

| <u>Configuration</u> | <u>Low</u> | <u>Even</u> | <u>Terms</u> | | |
|--|-------------------------------|---------------|---------------|------------|--|
| | <u>Term</u> | <u>Wave-</u> | <u>gMeas.</u> | <u>gLS</u> | |
| | | <u>Number</u> | | | |
| 4d ⁷ (⁴ F)·5s | a ⁵ F ₅ | 0.00 | 1.397 | 1.400 | |
| 4d ⁷ (⁴ F)·5s | a ⁵ F ₄ | 1190.62 | 1.349 | 1.350 | |
| 4d ⁷ (⁴ F)·5s | a ⁵ F ₃ | 2091.52 | 1.249 | 1.250 | |
| 4d ⁷ (⁴ F)·5s | a ⁵ F ₂ | 2713.24 | 1.000 | 1.000 | |
| 4d ⁷ (⁴ F)·5s | a ⁵ F ₁ | 3105.49 | 0.000 | 0.000 | |
| 4d ⁷ (⁴ F)·5s | a ³ F ₄ | 6545.04 | 1.284 | 1.250 | |
| 4d ⁶ 5s(⁶ D)·5s | a ⁵ D ₄ | 7483.09 | 1.447 | 1.500 | |
| 4d ⁷ (⁴ P)·5s | a ⁵ P ₂ | 8043.69 | 1.563 | 1.833 | |
| 4d ⁷ (⁴ F)·5s | a ³ F ₃ | 8084.11 | 1.196 | 1.083 | |
| 4d ⁶ 5s(⁶ D)·5s | a ⁵ D ₃ | 8575.41 | 1.420 | 1.500 | |
| 4d ⁷ (⁴ P)·5s | a ⁵ P ₃ | 8770.93 | 1.624 | 1.667 | |
| 4d ⁶ 5s(⁶ D)·5s | a ⁵ D ₂ | 9057.59 | 1.232 | 1.500 | |
| 4d ⁶ 5s(⁶ D)·5s | a ⁵ D ₁ | 9072.99 | 1.795 | 1.500 | |
| 4d ⁸ | b ³ F ₄ | 9120.61 | 1.255 | 1.250 | |
| 4d ⁷ (⁴ F)·5s | a ³ F ₂ | 9183.65 | 1.089 | 0.667 | |
| 4d ⁶ 5s(⁶ D)·5s | a ⁵ D ₀ | 9492.36 | 0/0 | 0/0 | |
| 4d ⁷ (⁴ P)·5s | a ⁵ P ₁ | 9620.33 | 1.985 | 2.500 | |
| 4d ⁷ (⁴ P)·5s | a ³ P ₂ | 10623.55 | 1.534 | 1.500 | |
| 4d ⁸ | b ³ F ₃ | 10654.60 | 1.086 | 1.083 | |
| 4d ⁸ | b ³ F ₂ | 11447.30 | 0.764 | 0.667 | |
| 4d ⁷ (⁴ P)·5s | a ³ P ₀ | 11752.61 | 0/0 | 0/0 | |
| 4d ⁷ (⁴ P)·5s | a ³ P ₁ | 11786.02 | 1.684 | 1.500 | |
| 4d ⁷ (² G)·5s | a ³ G ₅ | 12207.03 | 1.190 | 1.200 | |

| <u>Configuration</u> | <u>Term</u> | <u>Wave- Number</u> | <u>gMeas.</u> | <u>gLS</u> |
|--------------------------------------|-------------------------------|-------------------------|---------------|-------------------------------|
| 4d ⁷ (² G)·5s | a ³ G ₄ | 12816.68 | 1.033 | 1.050 |
| 4d ⁸ | b ³ P ₂ | 13645.74 | 1.315 | 1.500 |
| 4d ⁷ (² G)·5s | a ³ G ₃ | 13699.06 | 0.757 | 0.750 |
| 4d ⁸ | b ³ P ₁ | 13981.68 | 1.441 | 1.500 |
| 4d ⁸ | a ¹ G ₄ | 14700.29 | 0.992 | 1.000 |
| 4d ⁸ | b ³ P ₀ | 14827.48 | 0/0 | 0/0 |
| 4d ⁷ (² D)·5s | a ³ D ₂ | 15054.05 | 1.162 | 1.167 |
| 4d ⁷ (² H)·5s | a ³ H ₆ | 15550.15 | 1.164 | 1.167 |
| 4d ⁷ (² D)·5s | a ³ D ₃ | 16190.59 | 1.333 | 1.333 |
| 4d ⁷ (² H)·5s | a ³ H ₅ | 16240.11 | 1.041 | 1.033 |
| 4d ⁷ (² D)·5s | a ³ D ₁ | 16712.57 | 0.676 | 0.500 |
| 4d ⁸ | a ¹ D ₂ | 17045.96 | 1.175 | 1.000 |
| 4d ⁷ (² H)·5s | a ³ H ₄ | 17096.88 | 0.834 | 0.800 |
| 4d ⁷ (² H)·5s | a ¹ H ₅ | 20055.70 | 1.007 | 1.000 |
| 4d ⁷ (² P)·5s | a ¹ P ₁ | 20242.00 | 0.927 | 1.000 |
| --- | 42 ₂ | 20933.74 | 1.343 | ³ P ₂ ? |

Table VII

Middle Odd Terms

| <u>Configuration</u> | <u>Term</u> | <u>Wave- Number</u> | <u>gMeas</u> | <u>gLS</u> |
|--------------------------------------|--|-------------------------|--------------|------------|
| 4d ⁶ 5s(6D)·5p | z ⁷ D ₅ ⁰ | 25214.26 | 1.592 | 1.600 |
| 4d ⁶ 5s(6D)·5p | z ⁷ D ₄ ⁰ | 25464.55 | 1.625 | 1.650 |
| 4d ⁶ 5s(6D)·5p | z ⁷ D ₃ ⁰ | 26035.61 | 1.737 | 1.750 |
| 4d ⁷ (⁴ F)·5p | z ⁵ D ₄ ⁰ | 26312.86 | 1.486 | 1.500 |
| 4d ⁶ 5s(6D)·5p | z ⁷ D ₂ ⁰ | 26472.76 | 1.992 | 2.000 |
| 4d ⁶ 5s(6D)·5p | z ⁷ D ₁ ⁰ | 26780.49 | ----- | 3.000 |
| 4d ⁷ (⁴ F)·5p | z ⁵ F ₅ ⁰ | 26816.26 | 1.394 | 1.400 |
| 4d ⁷ (⁴ F)·5p | z ⁵ D ₃ ⁰ | 27506.63 | 1.425 | 1.500 |
| 4d ⁷ (⁴ F)·5p | z ⁵ F ₄ ⁰ | 28014.80 | 1.364 | 1.350 |
| 4d ⁷ (⁴ F)·5p | z ⁵ D ₂ ⁰ | 28465.75 | 1.324 | 1.500 |
| 4d ⁷ (⁴ F)·5p | z ³ G ₅ ⁰ | 28495.17 | 1.230 | 1.200 |
| 4d ⁷ (⁴ F)·5p | z ⁵ G ₆ ⁰ | 28571.95 | 1.379 | 1.333 |
| 4d ⁷ (⁴ F)·5p | z ⁵ F ₃ ⁰ | 28890.51 | 1.293 | 1.250 |
| 4d ⁷ (⁴ F)·5p | z ⁵ D ₁ ⁰ | 29118.51 | 0.953 | 1.500 |
| 4d ⁶ 5s(6D)·5p | z ⁷ F ₆ ⁰ | 29160.54 | 1.462 | 1.500 |
| 4d ⁷ (⁴ F)·5p | z ⁵ F ₂ ⁰ | 29427.36 | 1.164 | 1.000 |
| 4d ⁶ 5s(6D)·5p | z ⁷ F ₅ ⁰ | 29468.06 | 1.474 | 1.500 |
| 4d ⁷ (⁴ F)·5p | z ⁵ D ₀ ⁰ | 29570.02 | 0/0 | 0/0 |
| 4d ⁶ 5s(6D)·5p | z ⁷ F ₄ ⁰ | 29594.61 | 1.370 | 1.500 |
| 4d ⁷ (⁴ F)·5p | z ⁵ F ₁ ⁰ | 29693.63 | 0.567 | 0.000 |
| 4d ⁷ (⁴ F)·5p | z ³ G ₄ ⁰ | 29890.96 | ----- | 1.050 |
| 4d ⁶ 5s(6D)·5p | z ⁷ F ₃ ⁰ | 29891.97 | ----- | 1.500 |

| <u>Configuration</u> | <u>Term</u> | <u>Wave- Number</u> | <u>gMeas</u> | <u>gLS</u> |
|--------------------------------------|--|-------------------------|--------------|------------|
| 4d ⁶ 5s(6D)·5p | z ⁷ F ₂ ^o | 30018.36 | 1.497 | 1.500 |
| 4d ⁶ 5s(6D)·5p | z ⁷ F ₁ ^o | 30085.42 | ----- | 1.500 |
| 4d ⁶ 5s(6D)·5p | z ⁷ F ₀ ^o | 30115.32 | 0/0 | 0/0 |
| 4d ⁶ 5s(6D)·5p | z ⁷ P ₄ ^o | 30250.43 | 1.656 | 1.750 |
| 4d ⁷ (⁴ F)·5p | z ⁵ G ₅ ^o | 30279.72 | 1.263 | 1.267 |
| 4d ⁷ (⁴ F)·5p | z ³ F ₄ ^o | 30348.47 | 1.276 | 1.250 |
| 4d ⁷ (⁴ F)·5p | z ⁵ G ₃ ^o | 30537.10 | 0.944 | 0.917 |
| 4d ⁷ (⁴ F)·5p | z ⁵ G ₂ ^o | 30958.84 | 0.375 | 0.333 |
| 4d ⁷ (⁴ F)·5p | z ³ D ₃ ^o | 31044.39 | 1.204 | 1.333 |
| 4d ⁷ (⁴ P)·5p | z ⁵ S ₂ ^o | 31186.07 | 2.034 | 2.000 |
| 4d ⁷ (⁴ F)·5p | z ⁵ G ₄ ^o | 31345.85 | 1.111 | 1.150 |
| 4d ⁶ 5s(6D)·5p | z ⁷ P ₃ ^o | 31384.68 | 1.895 | 1.917 |
| 4d ⁷ (⁴ F)·5p | z ³ G ₃ ^o | 31852.93 | 0.868 | 0.750 |
| 4d ⁷ (⁴ F)·5p | z ³ D ₂ ^o | 32207.69 | 1.032 | 1.167 |
| 4d ⁶ 5s(6D)·5p | z ⁷ P ₂ ^o | 32343.35 | 2.059 | 2.333 |
| 4d ⁷ (⁴ F)·5p | z ³ F ₃ ^o | 32392.00 | 1.133 | 1.083 |
| 4d ⁷ (⁴ F)·5p | z ³ F ₂ ^o | 33172.08 | 1.026 | 0.667 |
| 4d ⁶ 5s(6D)·5p | y ⁵ D ₃ ^o | 33430.71 | 1.496 | 1.500 |
| 4d ⁶ 5s(6D)·5p | y ⁵ D ₄ ^o | 33446.88 | 1.492 | 1.500 |
| 4d ⁷ (⁴ F)·5p | z ³ D ₁ ^o | 33580.23 | 0.522 | 0.500 |
| 4d ⁶ 5s(6D)·5p | y ⁵ D ₂ ^o | 33728.70 | 1.477 | 1.500 |
| 4d ⁶ 5s(6D)·5p | z ⁵ P ₃ ^o | 34072.46 | 1.646 | 1.667 |
| 4d ⁶ 5s(6D)·5p | y ⁵ D ₁ ^o | 34091.10 | 1.522 | 1.500 |
| 4d ⁶ 5s(6D)·5p | y ⁵ D ₀ ^o | 34379.75 | 0/0 | 0/0 |
| 4d ⁶ 5s(6D)·5p | y ⁵ F ₅ ^o | 34772.60 | 1.402 | 1.400 |

| <u>Configuration</u> | <u>Term</u> | <u>Wave- Number</u> | <u>gMeas</u> | <u>gLS</u> |
|--|--|-------------------------|--------------|------------|
| 4d ⁶ 5s(⁶ D)·5p | z ⁵ P ₂ ⁰ | 34882.00 | 1.808 | 1.833 |
| 4d ⁶ 5s(⁶ D)·5p | z ⁵ P ₁ ⁰ | 35046.79 | 2.385 | 2.500 |
| 4d ⁶ 5s(⁶ D)·5p | y ⁵ F ₄ ⁰ | 35471.24 | 1.364 | 1.350 |
| 4d ⁶ 5s(⁶ D)·5p | y ⁵ F ₃ ⁰ | 35806.65 | 1.276 | 1.250 |
| 4d ⁶ 5s(⁶ D)·5p | y ⁵ F ₂ ⁰ | 35963.89 | 1.069 | 1.000 |
| 4d ⁶ 5s(⁶ D)·5p | y ⁵ F ₁ ⁰ | 36238.80 | 0.145 | 0.000 |
| 4d ⁷ (⁴ P)·5p | x ⁵ D ₄ ⁰ | 36542.71 | 1.481 | 1.500 |
| 4d ⁷ (⁴ P)·5p | x ⁵ D ₃ ⁰ | 36760.41 | 1.426 | 1.500 |
| 4d ⁷ (⁴ P)·5p | y ³ D ₂ ⁰ | 36965.32 | 1.173 | 1.167 |
| 4d ⁷ (⁴ P)·5p | z ³ P ₂ ⁰ | 37118.98 | 1.469 | 1.500 |
| 4d ⁷ (⁴ P)·5p | z ³ P ₁ ⁰ | 37346.79 | 1.311 | 1.500 |
| 4d ⁷ (⁴ P)·5p | y ³ D ₃ ⁰ | 37367.04 | 1.379 | 1.333 |
| 4d ⁷ (⁴ P)·5p | z ³ P ₀ ⁰ | 37472.98 | 0/0 | 0/0 |
| 4d ⁷ (⁴ P)·5p | y ³ D ₁ ⁰ | 37619.57 | 0.756 | 0.500 |
| 4d ⁷ (⁴ P)·5p | x ⁵ D ₂ ⁰ | 37667.92 | 1.442 | 1.500 |
| 4d ⁷ (⁴ P)·5p | x ⁵ D ₀ ⁰ | 37802.32 | 0/0 | 0/0 |
| ----- | 161 ₃ ⁰ | 37986.87? | ----- | ----- |
| 4d ⁷ (⁴ P)·5p | x ⁵ D ₁ ⁰ | 38200.49 | 1.569 | 1.500 |
| 4d ⁷ (² G)·5p | y ³ F ₄ ⁰ | 38243.46 | 1.107 | 1.250 |
| 4d ⁷ (² G)·5p | z ³ H ₅ ⁰ | 38297.15 | 1.048 | 1.033 |
| 4d ⁷ (⁴ P)·5p | z ³ S ₁ ⁰ | 38587.19 | 1.566 | 2.000 |
| 4d ⁷ (⁴ P)·5p | y ⁵ P ₃ ⁰ | 38706.40 | 1.631 | 1.667 |
| 4d ⁷ (² G)·5p | z ³ H ₆ ⁰ | 38897.60 | 1.174 | 1.167 |
| 4d ⁷ (⁴ P)·5p | y ⁵ P ₂ ⁰ | 39008.67 | 1.713 | 1.833 |
| 4d ⁷ (² F)·5p | x ³ F ₄ ⁰ | 39037.23 | 1.115 | 1.250 |

| <u>Configuration</u> | <u>Term</u> | <u>Wave- Number</u> | <u>gMeas</u> | <u>gLS</u> |
|--------------------------------------|--|-------------------------|--------------|---|
| 4d ⁷ (² G)·5p | z ³ H ₄ ⁰ | 39273.30 | 0.895 | 0.800 |
| 4d ⁷ (² G)·5p | y ³ F ₃ ⁰ | 39433.71 | 0.968 | 1.083 |
| 4d ⁷ (² G)·5p | y ³ G ₅ ⁰ | 39450.68 | 1.142 | 1.200 |
| 4d ⁷ (² D)·5p | y ³ P ₂ ⁰ | 39742.09 | 1.299 | 1.500 |
| 4d ⁷ (⁴ P)·5p | y ⁵ P ₁ ⁰ | 39773.57 | 2.315 | 2.500 |
| 4d ⁷ (² D)·5p | y ³ P ₀ ⁰ | 39894.58 | 0/0 | 0/0 |
| 4d ⁷ (² D)·5p | y ³ P ₁ ⁰ | 39916.61 | 1.606 | 1.500 |
| 4d ⁷ (² G)·5p | y ³ G ₃ ⁰ | 40235.44 | 0.890 | 0.750 |
| 4d ⁷ (² G)·5p | z ¹ G ₄ ⁰ | 40276.64 | 1.035 | 1.000 |
| 4d ⁷ (² G)·5p | y ³ F ₂ ⁰ | 40433.28 | 0.889 | 0.667 |
| 4d ⁷ (² G)·5p | y ³ G ₄ ⁰ | 40439.27 | 1.196 | 1.050 |
| 4d ⁷ (² G)·5p | z ¹ H ₅ ⁰ | 40616.24 | 1.020 | 1.000 |
| 4d ⁷ (² F)·5p | x ³ D ₃ ⁰ | 40768.15 | 1.159 | 1.333 |
| ----- | A181 ₄ ⁰ | 40941.96? | ----- | ----- |
| 4d ⁷ (² G)·5p | z ¹ F ₃ ⁰ | 40948.68 | 1.137 | 1.000 |
| 4d ⁷ (² F)·5p | x ³ D ₁ ⁰ | 41016.67 | 0.892 | 0.500 |
| 4d ⁷ (² D)·5p | w ³ F ₂ ⁰ | 41182.92 | 0.887 | 0.667 |
| 4d ⁷ (² D)·5p | w ³ F ₃ ⁰ | 41260.04 | 1.235 | 1.083 |
| ----- | 186 ₃ ⁰ | 41301.06? | ----- | ----- |
| 4d ⁷ (² F)·5p | x ³ F ₃ ⁰ | 41482.67 | 1.286 | 1.083 |
| 4d ⁷ (² H)·5p | z ³ I ₆ ⁰ | 41577.83 | 1.013 | 1.024 (¹ I ₆ ⁰ ?) |
| 4d ⁷ (² F)·5p | x ³ G ₅ ⁰ | 41739.43 | 1.197 | 1.200 |
| 4d ⁷ (² D)·5p | w ³ D ₂ ⁰ | 41756.25 | 1.182 | 1.167 |
| 4d ⁷ (² D)·5p | w ³ D ₃ ⁰ | 41880.89 | 1.163 | 1.333 |
| 4d ⁷ (² F)·5p | x ³ D ₂ ⁰ | 42007.24 | 1.007 | 1.167 |

| <u>Configuration</u> | <u>Term</u> | <u>Wave- Number</u> | <u>gMeas</u> | <u>gLS</u> |
|--------------------------------------|--|-------------------------|--------------|---------------------------|
| 4d ⁷ (² H)·5p | z ³ I ₇ ^o | 42260.69 | 1.146 | 1.143 |
| 4d ⁷ (² D)·5p | w ³ F ₄ ^o | 42346.86 | 1.247 | 1.250 |
| 4d ⁷ (² D)·5p | z ¹ P ₁ ^o | 42415.86 | 0.965 | 1.000 |
| 4d ⁷ (² F)·5p | x ³ F ₂ ^o | 42533.86 | 1.025 | 0.667 |
| 4d ⁷ (² P)·5p | z ¹ S ₀ ^o | 42620.83 | 0/0 | 0/0 |
| 4d ⁷ (² D)·5p | w ³ D ₁ ^o | 42894.47 | 0.810 | 0.500 |
| 4d ⁷ (² H)·5p | z ³ I ₅ ^o | 42978.27 | 0.861 | 0.833 |
| 4d ⁷ (² D)·5p | y ¹ F ₃ ^o | 42998.33 | 0.995 | 1.000 |
| 4d ⁷ (² P)·5p | y ³ S ₁ ^o | 43107.53 | 1.533 | 2.000 |
| 4d ⁷ (² P)·5p | v ³ D ₂ ^o | 43509.20 | 1.158 | 1.167 |
| 4d ⁷ (⁴ F)·6p | y ⁵ G ₅ ^o | 43742.82 | 1.272 | 1.267 |
| 4d ⁷ (² P)·5p | v ³ D ₁ ^o | 43841.57 | 0.800 | 0.500 |
| 4d ⁷ (⁴ F)·6p | y ⁵ G ₄ ^o | 43862.92 | ----- | 1.150 |
| 4d ⁷ (² D)·5p | z ¹ D ₂ ^o | 43903.46 | 1.026 | 1.000 |
| 4d ⁷ (² F)·5p | x ¹ F ₃ ^o ? | 43975.83 | 0.934 | 1.000 (204 ^o) |
| 4d ⁷ (⁴ F)·6p | y ⁵ G ₆ ^o | 43998.68 | 1.219 | 1.333 |
| 4d ⁷ (² H)·5p | y ¹ H ₅ ^o | 44109.06 | 1.033 | 1.000 |
| 4d ⁷ (² F)·5p | x ³ P ₂ ^o | 44234.70 | 1.422 | 1.500 |
| 4d ⁷ (⁴ F)·6p | w ⁵ D ₄ ^o | 44243.49 | 1.473 | 1.500 |
| 4d ⁷ (² F)·5p | x ³ P ₁ ^o | 44301.18 | 1.350 | 1.500 |
| 4d ⁷ (⁴ F)·6p | x ⁵ F ₅ ^o | 44321.86 | 1.303 | 1.400 |
| 4d ⁷ (² F)·5p | x ³ G ₃ ^o | 44441.51 | 0.76 | 0.750 |
| 4d ⁷ (² H)·5p | y ³ H ₆ ^o | 44491.63 | 1.163 | 1.167 |
| 4d ⁷ (⁴ F)·6p | x ⁵ F ₄ ^o | 44607.67 | ----- | 1.350 |
| 4d ⁷ (⁴ F)·6p | w ³ G ₄ ^o | 44662.01 | 0.925 | 1.050 |

| <u>Configuration</u> | <u>Term</u> | <u>Wave- Number</u> | <u>gMeas</u> | <u>gLS</u> |
|--------------------------------------|--|-------------------------|--------------|--|
| 4d ⁷ (⁴ F)·6p | y ⁵ G ₃ ⁰ | 44800.77 | ----- | 0.917 |
| 4d ⁷ (² F)·5p | x ³ G ₄ ⁰ | 44822.86 | ----- | 1.050 |
| 4d ⁷ (⁴ F)·6p | y ⁵ G ₂ ⁰ | 44891.35 | 0.383 | 0.333 |
| 4d ⁷ (⁴ F)·6p | w ⁵ D ₃ ⁰ | 45071.43 | 1.449 | 1.500 |
| 4d ⁷ (⁴ F)·6p | x ⁵ F ₃ ⁰ | 45201.98 | 1.059 | 1.250 |
| 4d ⁷ (² H)·5p | y ³ H ₄ ⁰ | 45364.80 | 0.962 | 0.800 |
| 4d ⁷ (⁴ F)·6p | u ³ D ₃ ⁰ | 45475.76 | 1.547 | 1.333 |
| ----- | 216 ₄ ⁰ | 45528.60 | ----- | ----- |
| 4d ⁷ (⁴ F)·6p | w ³ G ₃ ⁰ | 45549.49 | ----- | 0.750 |
| 4d ⁷ (⁴ F)·6p | w ³ G ₅ ⁰ | 45755.63 | ----- | 1.200 |
| 4d ⁷ (⁴ F)·6p | w ⁵ D ₂ ⁰ | 45790.42 | 1.484 | 1.500 |
| 4d ⁷ (⁴ F)·6p | u ³ D ₂ ⁰ | 45923.34 | 1.089 | 1.167 |
| 4d ⁷ (⁴ F)·6p | u ³ D ₁ ⁰ ? | 46056.25 | 1.115 | 0.500 |
| ----- | 222 ₄ ⁰ | 46067.22 | ----- | ----- |
| 4d ⁷ (⁴ F)·6p | w ⁵ D ₀ ⁰ | 46102.95 | 0/0 | 0/0 |
| 4d ⁷ (⁴ F)·6p | w ⁵ D ₁ ⁰ | 46191.44 | 1.439 | 1.500 |
| ----- | 225 ₄ ⁰ | 46273.15 | ----- | ----- |
| ----- | 226 ₄ ⁰ | 46400.63 | ----- | ----- |
| 4d ⁷ (² H)·5p | y ³ H ₅ ⁰ | 46495.08 | 1.030 | 1.033 |
| ----- | B226 ₁ ⁰ | 46499.79 | 0.72 | ----- (3D ₁ ⁰ ?) |
| ----- | 227 ₁ ⁰ | 46528.21 | 1.065 | ----- |
| 4d ⁷ (⁴ F)·6p | w ³ F ₄ ⁰ | 46695.03 | ----- | 1.250 |
| 4d ⁷ (⁴ F)·6p | w ³ F ₃ ⁰ | 46746.30 | ----- | 1.083 |
| ----- | 230 ₂ ⁰ | 46803.59 | ----- | ----- |
| ----- | 231 ₃ ⁰ | 46946.57 | ----- | ----- |
| ----- | A231 ₃ ⁰ | 47046.59 | ----- | ----- |

| <u>Configuration</u> | <u>Term</u> | <u>Wave- Number</u> | <u>gMeas</u> | <u>gLS</u> |
|--------------------------------------|--|-------------------------|--------------|------------|
| ----- | B231 ₄ ⁰ | 47157.25 | ----- | ----- |
| 4d ⁷ (⁴ F)·6p | w ³ F ₂ ⁰ | 47247.92 | 0.702 | 0.667 |
| ----- | 233 ₄ ⁰ | 47261.53 | ----- | ----- |
| ----- | 234 ₃ ⁰ | 47339.34 | ----- | ----- |
| ----- | 235 ₂ ⁰ | 47345.07 | ----- | ----- |
| ----- | C235 ₃ ⁰ | 47526.04 | ----- | ----- |
| ----- | D235 ₂ ⁰ | 47547.36 | ----- | ----- |
| ----- | A235 ₃ ⁰ | 47635.33 | 1.055 | ----- |
| ----- | B235 ₃ ⁰ | 47788.68 | ----- | ----- |
| ----- | 236 ₁ ⁰ | 47809.11 | ----- | ----- |
| ----- | 237 ₄ ⁰ | 47817.77 | ----- | ----- |
| ----- | A237 ₃ ⁰ | 47868.35 | ----- | ----- |
| ----- | 238 ₃ ⁰ | 48003.01 | ----- | ----- |
| ----- | 239 ₄ ⁰ | 48109.34 | ----- | ----- |
| ----- | A239 _{4,5} ⁰ | 48144.03 | ----- | ----- |
| ----- | 240 ₂ ⁰ | 48164.76 | ----- | ----- |
| ----- | 241 ₃ ⁰ | 48405.02 | ----- | ----- |
| ----- | A241 ₃ ⁰ | 48492.96 | 1.143 | ----- |
| ----- | B241 ₅ ⁰ | 48503.36 | ----- | ----- |
| ----- | 242 ₃ ⁰ | 48570.79 | ----- | ----- |
| ----- | B242 ₄ ⁰ | 48597.43 | ----- | ----- |
| ----- | C242 ₁ ⁰ | 48604.39 | ----- | ----- |
| ----- | A242 ₃ ⁰ | 48765.87 | ----- | ----- |
| ----- | 243 ₂ ⁰ | 48779.07 | ----- | ----- |
| ----- | A243 ₃ ⁰ | 48933.86 | ----- | ----- |

| <u>Configuration</u> | <u>Term</u> | <u>Wave- Number</u> | <u>gMeas</u> | <u>gLS</u> |
|----------------------|----------------------------------|-------------------------|--------------|------------|
| ----- | D243 ⁰ ₃ | 48964.14 | ----- | ----- |
| ----- | E243 ⁰ ₁ | 49047.52 | ----- | ----- |
| ----- | B243 ⁰ ₃ | 49141.47 | ----- | ----- |
| ----- | C243 ⁰ ₄ | 49164.96 | ----- | ----- |
| ----- | F243 ⁰ ₂ | 49455.52 | ----- | ----- |
| ----- | 244 ⁰ ₄ | 49949.13 | ----- | ----- |
| ----- | E244 ⁰ ₂ | 49970.64 | ----- | ----- |
| ----- | D244 ⁰ ₂ | 50027.96 | ----- | ----- |
| ----- | B244 ⁰ ₅ | 50122.40 | 1.169 | ----- |
| ----- | A244 ⁰ _{1,2} | 50163.60 | ----- | ----- |
| ----- | F244 ⁰ ₁ | 50192.00 | ----- | ----- |
| ----- | G244 ⁰ ₁ | 50338.91 | ----- | ----- |
| ----- | C244 ⁰ ₁ | 50775.96 | ----- | ----- |
| ----- | 245 ⁰ ₄ | 51360.25 | 1.094 | ----- |
| ----- | 246 ⁰ ₂ | 51728.28 | ----- | ----- |

Table VIII

High Even Terms

| <u>Configuration</u> | <u>Desig</u> | <u>Prob. Term</u> | <u>Wave-Number</u> | <u>gMeas</u> |
|--------------------------------------|------------------|---------------------------------|--------------------|--------------|
| 4d ⁷ (⁴ F)·6s | 43 ₅ | e ⁵ F ₅ | 41256.41 | |
| 4d ⁷ (⁴ F)·6s | A43 ₄ | e ³ F ₄ | 41825.27 | |
| --- | 44 ₄ | --- | 42895.47 | |
| 4d ⁷ (⁴ F)·6s | 45 ₄ | e ⁵ F ₄ | 43018.63 | |
| 4d ⁷ (⁴ F)·6s | 46 ₃ | e ⁵ F ₃ | 43115.51 | |
| --- | 47 ₅ | --- | 43139.17? | |
| 4d ⁷ (⁴ F)·6s | 48 ₂ | e ⁵ F ₂ | 43892.12 | |
| 4d ⁷ (⁴ F)·6s | 49 ₃ | e ³ F ₃ | 44176.30 | |
| 4d ⁷ (⁴ F)·6s | A49 ₁ | e ⁵ F ₁ | 44343.83 | |
| 4d ⁷ (⁴ F)·6s | 50 ₂ | e ³ F ₂ | 44970.06 | |
| --- | 51 ₅ | --- | 46906.38 | |
| --- | 52 ₅ | e ³ G ₅ | 47084.86 | 1.19 |
| --- | 53 ₄ | e ³ G ₄ | 47188.35 | |
| --- | 55 ₄ | f ³ F ₄ ? | 47671.04 | |
| --- | 56 ₂ | --- | 49513.34 | |
| --- | 57 ₄ | --- | 49553.89 | 1.01 |
| --- | 58 ₄ | --- | 49555.31 | |
| --- | 59 ₃ | f ³ F ₃ | 49590.93 | 1.12 |
| --- | 60 ₂ | --- | 49757.93 | |
| --- | 61 ₂ | --- | 49882.22 | |
| --- | 62 ₂ | --- | 50521.27 | |
| --- | 63 ₄ | --- | 61387.74 | |

Table IX

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman g_1 | Effect g_2 |
|-----------|-----|-----|-------|----------|------------|-----------------|-----------------|
| 9322.81 | tr | - | MF | 10723.44 | $z^3F_3^0$ | - | 46 |
| 9273.15 | 4 | - | MIT | 10780.87 | $z^3D_3^0$ | - | A43 |
| 9155.71 | tr | - | MF | 10919.15 | 42 | - | $z^3G_3^0$ |
| 8984.95 | 2 | - | MF | 11004.20 | $z^3F_2^0$ | - | 49 |
| 8777.39 | 3 | - | MF | 11389.78 | $z^3D_1^0$ | - | 50 |
| 8724.98 | 3 | - | MIT | 11458.20 | 42 | - | $z^3F_3^0$ |
| 8710.76 | 2 | - | M | 11476.90 | $z^3F_4^0$ | - | A43 |
| 8483.56 | 2 | - | M | 11784.31 | $z^3F_3^0$ | - | 49 |
| 8473.75 | 2 | - | MF | 11797.91 | $z^3F_2^0$ | - | 50 |
| 8448.57 | 0 | - | M | 11833.07 | $z^7P_2^0$ | - | 49 |
| 8435.76 | 1 | - | M | 11851.04 | $z^3D_3^0$ | - | 44 |
| 8352.94 | 12 | - | MIT | 11968.55 | $z^3D_2^0$ | - | 49 |
| 8348.98 | 15 | - | MIT | 11974.23 | $z^3D_3^0$ | - | 45 |
| 8281.93 | tr | - | MF | 12071.16 | $z^3D_3^0$ | - | 46 |
| 8239.27 | 2 | - | MF | 12133.67 | $x^5F_5^0$ | - | 51 |
| 8184.98 | 3 | - | MF | 12214.15 | $x^5D_2^0$ | - | 61 |
| 8173.92 | 1 | - | MIT | 12230.67 | $z^7F_4^0$ | - | A43 |
| 8168.78 | 3 | - | MIT | 12238.37 | 42 | - | $z^3F_2^0$ |
| 8157.69 | 3 | - | MIT | 12255.01 | a^3H_5 | - | $z^3G_5^0$ |
| 8112.47 | 20 | - | MIT | 12323.32 | $z^3G_3^0$ | - | 49 |
| 8074.44 | 3 | - | MF | 12381.36 | a^1D_2 | - | $z^5F_2^0$ |
| 8058.54 | 2 | - | MF | 12405.79 | a^3D_1 | - | $z^5D_1^0$ |
| 8009.64 | 2 | - | MF | 12481.53 | $z^5G_3^0$ | - | 45 |
| 7999.72 | 3 | - | MIT | 12497.00 | 42 | - | $y^5D_3^0$ |
| 7975.45 | 3 | - | MF | 12535.03 | $z^3P_1^0$ | - | 61 |
| 7948.15 | 15 | - | MIT | 12578.09 | $z^3F_3^0$ | - | 50 |
| 7924.43 | 25 | - | MIT | 12615.74 | $z^5G_5^0$ | - | 44 |
| 7917.55 | 2 | - | MIT | 12626.70 | $z^7P_2^0$ | - | 50 |
| 7905.16 | 0 | - | M | 12646.49 | 42 | - | $z^3D_1^0$ |
| 7904.20 | 1 | - | MF | 12648.03 | a^3G_4 | - | $z^7D_4^0$ |
| 7890.37 | 20 | - | MIT | 12670.19 | $z^3F_4^0$ | - | 45 |
| 7881.49 | 10 | - | MIT | 12684.47 | $z^5G_6^0$ | - | 43 |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman Effect | |
|-----------|-----|-----|-------|----------|-----------------------------------|---------------|-------|
| | | | | | | g_1 | g_2 |
| 7871.94 | 3 | - | MIT | 12699.88 | $a^3D_3 - z^5F_3^{\circ}$ | | |
| 7847.80 | 100 | - | MIT | 12738.93 | $z^5G_5^{\circ} - 45$ | | |
| 7833.39 | 10 | - | MIT | 12762.36 | $z^3D_2^{\circ} - 50$ | | |
| 7830.52 | 2 | - | MIT | 12767.04 | $z^3F_4^{\circ} - 46$ | | |
| 7829.81 | 7 | - | MIT | 12768.19 | $z^7P_4^{\circ} - 45$ | | |
| 7815.45 | tr | - | MF | 12791.65 | $z^7P_3^{\circ} - 49$ | | |
| 7814.00 | tr | - | MF | 12794.03 | $a^3H_4 - z^3G_4^{\circ}$ | | |
| 7813.51 | 1 | - | M | 12794.83 | $x^5D_3^{\circ} - 58$ | | |
| 7813.45 | 3 | - | MF | 12794.93 | $42 - y^5D_2^{\circ}$ | | |
| 7791.86 | 100 | - | MIT | 12830.38 | $z^5G_4^{\circ} - 49$ | | |
| | | | | or | $x^5D_3^{\circ} - 59$ | | |
| 7781.37 | 1 | - | M | 12847.68 | $z^3D_3^{\circ} - 48$ | | |
| 7775.41 | 60 | - | MIT | 12857.53 | $a^3D_1 - z^5D_0^{\circ}$ | | |
| 7774.14 | 100 | - | MIT | 12859.62 | $z^3F_4^{\circ} - 47$ | | |
| 7770.92 | 2 | - | MF | 12864.95 | $z^7P_4^{\circ} - 46$ | | |
| 7729.91 | 3 | - | MF | 12933.21 | $z^5G_2^{\circ} - 48$ | | |
| 7722.87 | 25 | - | MIT | 12944.99 | $a^3H_6 - z^3G_5^{\circ}$ | | |
| 7701.39 | 1 | - | M | 12981.10 | $a^3D_1 - z^5F_1^{\circ}$ | | |
| 7687.48 | 2 | - | M | 13004.60 | $z^3G_4^{\circ} - 44$ | | |
| 7621.50 | 10 | - | MIT | 13117.17 | $z^3G_3^{\circ} - 50$ | | |
| 7612.94 | 3 | - | MIT | 13131.92 | $z^3D_3^{\circ} - 48$ | | |
| 7609.00 | 1 | - | M | 13138.72 | $42 - z^5P_3^{\circ}$ | | |
| 7559.61 | 100 | - | MIT | 13224.56 | $z^3G_4^{\circ} - 46$ | | |
| 7549.87 | 0 | - | M | 13241.62 | $z^5F_4^{\circ} - 43$ | | |
| 7544.20 | 1 | - | M | 13251.57 | $a^3H_4 - z^3F_4^{\circ}$ | | |
| 7540.83 | 0 | - | M | 13257.50 | $a^3G_5 - z^7D_4^{\circ}$ | | |
| 7499.75 | 200 | - | MIT | 13330.11 | $z^3G_5^{\circ} - A43$ | | |
| 7495.18 | 0 | - | M | 13338.24 | $a^1P_1 - z^3D_1^{\circ}$ | | |
| 7485.79 | 150 | - | MIT | 13354.97 | $z^5G_3^{\circ} - 48$ | | |
| 7468.91 | 150 | - | MIT | 13385.15 | $238^{\circ} - 63$ | | |
| | | | | or | $z^5G_2^{\circ} - e^5F_1^{\circ}$ | | |
| 7458.44 | 3 | - | MF | 13403.94 | $a^3D_3 - z^7F_4^{\circ}$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman Effect |
|-----------|-----|-----|-------|----------|------------------|--------------------|
| 7445.45 | 4 | - | MIT | 13427.33 | $z^7F_5^{\circ}$ | - 44 |
| 7438.33 | 4 | - | MIT | 13440.18 | a^3H_4 | - $z^5G_3^{\circ}$ |
| 7410.25 | 5 | - | MIT | 13491.11 | a^1D_2 | - $z^5G_3^{\circ}$ |
| 7407.49 | 4 | - | MIT | 13496.14 | a^3G_4 | - $z^5D_4^{\circ}$ |
| 7393.13 | 150 | - | MIT | 13520.89 | $z^7F_4^{\circ}$ | - 46 |
| 7381.08 | 9 | - | MIT | 13544.43 | $z^7F_4^{\circ}$ | - 47 |
| 7377.77 | 20 | - | MIT | 13550.50 | $z^7F_5^{\circ}$ | - 45 |
| 7329.78 | 3 | - | MF | 13639.22 | $z^5G_3^{\circ}$ | - 49 |
| 7323.56 | 25 | - | MIT | 13650.80 | a^3H_5 | - $z^3G_4^{\circ}$ |
| 7312.63 | 5 | - | MIT | 13671.21 | $z^7F_5^{\circ}$ | - 47 |
| 7297.07 | 4 | - | MIT | 13700.36 | a^3D_3 | - $z^3G_4^{\circ}$ |
| 7272.22 | 3 | - | MF | 13747.18 | $x^5F_3^{\circ}$ | - 57 |
| 7266.88 | 3 | - | M | 13757.28 | $y^5D_3^{\circ}$ | - 53 |
| 7229.80 | 2 | - | MF | 13827.84 | a^3D_3 | - $z^7F_2^{\circ}$ |
| 7225.29 | 2 | - | MF | 13836.47 | a^3D_2 | - $z^5F_3^{\circ}$ |
| 7212.58 | 3 | - | MF | 13860.85 | b^3P_2 | - $z^5D_3^{\circ}$ |
| 7205.78 | 0 | - | M | 13873.93 | $z^7F_2^{\circ}$ | - 48 |
| 7183.02 | 6 | - | MIT | 13917.89 | a^3H_6 | - $z^7F_5^{\circ}$ |
| 7178.90 | 2 | - | MF | 13925.88 | $z^7P_4^{\circ}$ | - 49 |
| | | | | or | $z^3D_3^{\circ}$ | - 50 |
| 7167.77 | 4 | - | MIT | 13947.50 | a^3H_4 | - $z^3D_3^{\circ}$ |
| 7165.83 | Oh | - | M | 13951.28 | $x^5F_3^{\circ}$ | - 60 |
| 7141.72 | 9 | - | MIT | 13998.38 | a^1D_2 | - $z^3D_3^{\circ}$ |
| 7135.64 | 3 | - | MF | 14010.29 | a^3H_5 | - $z^7P_4^{\circ}$ |
| 7135.19 | 6 | - | MIT | 14011.19 | $z^5G_2^{\circ}$ | - 50 |
| 7120.75 | 2 | - | MF | 14039.60 | a^3H_5 | - $z^5G_5^{\circ}$ |
| 7110.59 | 5 | - | MIT | 14059.66 | a^3D_3 | - $z^7P_4^{\circ}$ |
| 7087.35 | 40 | - | MIT | 14105.76 | a^3G_5 | - $z^5D_4^{\circ}$ |
| 7086.06 | 40 | - | MIT | 14108.33 | a^3H_5 | - $z^3F_4^{\circ}$ |
| 7080.29 | 2 | - | MF | 14119.83 | $x^5F_4^{\circ}$ | - 59 |
| 7070.18 | 3 | - | MF | 14140.02 | a^1D_2 | - $z^5S_2^{\circ}$ |
| 7061.20 | 25 | - | MIT | 14157.98 | a^3D_3 | - $z^3F_4^{\circ}$ |
| | | | | or | $z^7F_2^{\circ}$ | - 49 |
| 7027.98 | 250 | - | MIT | 14224.92 | $z^5F_3^{\circ}$ | - 46 |
| 7017.46 | 3 | - | MF | 14246.25 | a^3D_1 | - $z^5G_2^{\circ}$ |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman Effect |
|-----------|-----|-----|-------|---------------------|----------------------------|---------------|
| 7016.17 | 2 | - | MF | 14248.87 | $a^3H_4 - z^5G_4^{\circ}$ | |
| 6998.33 | 3 | - | MF | 14285.19 | $z^3G_4^{\circ} - 49$ | |
| 6995.52 | 2 | - | MF | 14290.93 | $b^3P_0 - z^5D_1^{\circ}$ | |
| 6968.43 | 2 | - | MF | 14346.48 | $a^3D_3 - z^5G_3^{\circ}$ | |
| 6923.23 | 300 | - | MIT | 14440.15 | $z^5F_5^{\circ} - 43$ | |
| 6911.48 | 100 | - | MIT | 14464.70 | $z^5F_2^{\circ} - 48$ | |
| 6902.23 | 3 | - | MF | 14484.08 | $b^3P_1 - z^5D_2^{\circ}$ | |
| 6883.50 | 2 | - | MF | 14523.49 | $z^3G_5^{\circ} - 45$ | |
| 6852.92 | 0 | - | M | 14588.30 | $b^3F_2 - z^7D_3^{\circ}$ | |
| 6843.13 | 0 | - | M | 14609.17 | $a^3G_5 - z^5F_5^{\circ}$ | |
| 6838.00 | 3 | - | MF | 14620.13 | $z^3G_5^{\circ} - 46$ | |
| 6807.07 | tr | - | MF | 14686.56 | $a^3P_1 - z^7D_2^{\circ}$ | |
| 6805.54 | 5 | - | MIT | 14689.86 | $a^3G_4 - z^5D_3^{\circ}$ | |
| 6787.23 | 20 | - | MIT | 14729.49 | $a^3H_6 - z^5G_5^{\circ}$ | |
| 6775.02 | 40 | - | MIT | 14756.04 | $a^3H_4 - z^3G_3^{\circ}$ | |
| 6770.12 | tr | - | MF | 14766.72 | $a^3G_3 - z^5D_2^{\circ}$ | |
| 6766.95 | 30 | - | MIT | 14773.64 | $z^5D_1^{\circ} - 48$ | |
| 6756.54 | 9 | - | MIT | 14796.40 | $z^3F_3^{\circ} - 53$ | |
| 6751.78 | 3 | - | MF | 14806.83 | $a^1D_2 - z^3G_3^{\circ}$ | |
| 6730.45 | 25 | - | MIT | 14853.75 | $a^3D_3 - z^3D_3^{\circ}$ | |
| 6724.76 | 0 | - | M | 14866.32 | $b^3P_0 - z^5F_1^{\circ}$ | |
| 6721.81 | 3 | - | MF | 14872.85 | 42 - $\nabla^5F_3^{\circ}$ | |
| 6718.30 | 15 | - | MIT | 14880.62 | $z^5F_4^{\circ} - 44$ | |
| 6690.001 | 300 | - | MIT | 14943.56 | $z^5D_4^{\circ} - 43$ | |
| 6664.14 | 5 | - | MIT | 15001.51 | $z^5F_3^{\circ} - 48$ | |
| 6663.139 | 100 | - | MIT | 15003.80 | $z^5F_4^{\circ} - 45$ | |
| 6651.485 | 3 | - | MF | 15030.09 | 42 - $\nabla^5F_2^{\circ}$ | |
| 6648.10 | 1 | - | EV | 15037.74 | $a^3P_0 - z^7D_1^{\circ}$ | |
| 6620.45 | 2 | - | MF | 15100.55 | $z^5F_4^{\circ} - 46$ | |
| 6618.195 | 20 | - | MIT | 15105.70 | $a^3H_5 - z^5G_4^{\circ}$ | |
| 6596.584 | 4 | - | MIT | 15155.19 | $a^3D_3 - z^5G_4^{\circ}$ | |
| 6593.745 | 15 | - | MIT | 15161.71 | $a^1D_2 - z^3D_2^{\circ}$ | |
| 6577.96 | 2 | - | MF | 15198.09 | $a^3G_4 - z^5F_4^{\circ}$ | |
| 6557.835 | 2 | - | MF | 15244.73 | $b^3P_2 - z^5F_3^{\circ}$ | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman Effect |
|-----------|-----|-----|-------|----------|------------|---------------|
| 6544.25 | 5 | - | MIT | 15276.38 | $z^5F_1^o$ | - 50 |
| 6540.236 | 15 | - | MIT | 15285.77 | $z^5F_3^o$ | - 49 |
| 6519.077 | 3 | - | MF | 15335.37 | $z^3G_3^o$ | - 53 |
| 6499.75 | 0 | - | M | 15380.97 | b^3F_3 | - $z^7D_3^o$ |
| 6496.439 | 25 | - | MIT | 15388.80 | $z^5D_3^o$ | - 44 |
| 6486.650 | 3 | - | MF | 15412.03 | a^3P_2 | - $z^7D_3^o$ |
| 6485.19 | 2 | - | MF | 15415.50 | a^1H_5 | - $z^5F_4^o$ |
| 6472.54 | 2 | - | M | 15445.63 | b^3P_1 | - $z^5F_2^o$ |
| 6461.19 | tr | - | MF | 15472.76 | b^3P_2 | - $z^5D_1^o$ |
| 6456.928 | tr | - | MF | 15482.97 | a^3D_2 | - $z^5G_3^o$ |
| 6451.86 | 1 | - | M | 15495.13 | a^3D_1 | - $z^3D_2^o$ |
| 6444.856 | 25 | - | MIT | 15511.97 | $z^5D_3^o$ | - 45 |
| 6432.11 | 1 | - | M | 15542.69 | $z^5F_2^o$ | - 50 |
| 6413.30 | 0 | - | M | 15588.30 | b^3P_1 | - $z^5D_0^o$ |
| 6404.85 | 0 | - | M | 15608.85 | $z^5D_3^o$ | - 46 |
| 6384.669 | 3 | - | MF | 15658.20 | b^3F_3 | - $z^5D_4^o$ |
| 6383.003 | 3 | - | MF | 15662.29 | a^3D_3 | - $z^3G_3^o$ |
| 6376.450 | 9 | - | MIT | 15678.38 | a^3G_4 | - $z^3G_5^o$ |
| 6363.407 | 4 | - | MIT | 15710.55 | $z^5D_2^o$ | - 49 |
| 6351.891 | 2 | - | MIT | 15739.00 | $z^5G_4^o$ | - 52 |
| 6336.121 | 5 | - | MIT | 15781.73 | b^3P_2 | - $z^5F_2^o$ |
| 6330.619 | 20 | - | MIT | 15791.89 | $z^7D_4^o$ | - 43 |
| 6324.280 | 2 | - | MF | 15807.71 | a^3G_5 | - $z^5F_4^o$ |
| 6316.730 | 4 | - | MIT | 15826.61 | 42 | - $x^5D_3^o$ |
| 6310.38 | 0 | - | M | 15842.54 | $z^5G_4^o$ | - 53 |
| 6306.786 | tr | - | MF | 15851.56 | $z^5D_1^o$ | - 50 |
| 6289.350 | tr | - | MF | 15895.51 | a^3G_3 | - $z^7F_4^o$ |
| 6285.685 | tr | - | MF | 15904.77 | a^3D_2 | - $z^5G_2^o$ |
| 6274.502 | tr | - | MF | 15933.12 | $y^5D_2^o$ | - 56 |
| 6252.061 | 2 | - | MF | 15990.31 | a^3D_2 | - $z^3D_3^o$ |
| 6241.643 | tr | - | MF | 16017.00 | a^3D_3 | - $z^3D_2^o$ |
| 6235.968 | tr | - | MF | 16031.58 | 42 | - $y^3D_2^o$ |
| 6231.798 | 3 | - | MF | 16042.05 | $z^7D_5^o$ | - 43 |
| 6225.203 | 20 | - | MIT | 16059.30 | b^3F_2 | - $z^5F_3^o$ |
| 6219.55 | 1 | - | M | 16073.89 | a^3G_4 | - $z^5F_3^o$ |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman Effect |
|-----------|-----|-----|-------|----------|------------|---------------|
| 6217.48 | 2 | - | M | 16079.24 | $z^5F_5^o$ | - 44 |
| 6213.66 | 1 | - | M | 16089.13 | $z^5F_3^o$ | - 50 |
| 6199.431 | 3 | - | MF | 16126.06 | a^1D_2 | - $z^3F_2^o$ |
| 6197.149 | tr | - | MF | 16132.00 | a^3D_2 | - $z^5S_2^o$ |
| 6192.561 | 9 | - | MIT | 16143.95 | $z^3D_3^o$ | - 53 |
| | | | | or | $y^5D_4^o$ | - 59 |
| 6185.843 | tr | - | MF | 16161.48 | $z^5F_4^o$ | - 49 |
| 6179.571 | tr | - | MF | 16177.86 | $z^3D_1^o$ | - 60 |
| 6176.784 | 9 | - | MIT | 16185.18 | 42 | - $z^3P_2^o$ |
| 6174.226 | 3 | - | MF | 16191.89 | a^3G_3 | - $z^3G_4^o$ |
| 6170.609 | 15 | - | MIT | 16201.38 | a^3D_3 | - $z^3F_3^o$ |
| 6170.217 | 2 | - | MF | 16202.41 | $z^5F_5^o$ | - 44 |
| 6137.70 | 1 | - | M | 16288.25 | a^3G_5 | - $z^3d_5^o$ |
| 6132.493 | tr | - | MF | 16302.08 | $z^3D_1^o$ | - 62 |
| 6116.772 | 25 | - | MIT | 16343.98 | b^3F_4 | - $z^7D_4^o$ |
| | | | | or | a^1G_4 | - $z^3D_3^o$ |
| 6108.967 | 3 | - | MF | 16364.86 | a^3G_5 | - $z^5G_6^o$ |
| 6101.586 | 2 | - | MF | 16384.66 | a^1D_2 | - $y^5D_3^o$ |
| 6083.551 | 4 | - | MIT | 16433.23 | 42 | - $y^3D_3^o$ |
| 6077.779 | tr | - | MF | 16448.83 | $z^5P_3^o$ | - 62 |
| 6073.906 | 2 | - | MF | 16459.32 | a^3D_1 | - $z^3F_2^o$ |
| 6037.719 | tr | - | MF | 16557.94 | $z^3F_4^o$ | - 51 |
| 6012.803 | tr | - | MF | 16626.58 | $z^5G_5^o$ | - 51 |
| | | | | or | $z^3D_3^o$ | - 55 |
| 6004.428 | tr | - | MF | 16649.77 | a^3G_3 | - $z^3F_4^o?$ |
| 6003.859 | 2 | - | MF | 16651.32 | a^3G_4 | - $z^7F_5^o$ |
| | | | | or | $z^5G_3^o$ | - 53 |
| 5993.653 | 15 | - | MIT | 16679.71 | a^3P_1 | - $z^5D_2^o$ |
| 5992.585 | tr | - | MF | 16682.68 | a^1D_2 | - $y^5D_2^o$ |
| 5991.452 | tr | - | MF | 16685.83 | 42 | - $y^3D_1^o$ |
| 5988.672 | 12 | - | MIT | 16693.53 | a^5P_3 | - $z^7D_4^o$ |
| 5978.07 | 0 | - | M | 16723.19 | a^1P_1 | - $y^3D_2^o$ |
| 5974.167 | 6 | - | MIT | 16734.11 | 42 | - $x^5D_2^o$ |
| 5973.379 | 12 | - | MIT | 16736.32 | $z^3F_4^o$ | - 52 |
| 5953.38 | 1 | - | M | 16792.53 | $y^5D_2^o$ | - 62 |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman Effect | |
|-----------|------|-----|-------|----------|---|---------------|-------|
| | | | | | | g_1 | g_2 |
| 5951.146 | 5 | - | MIT | 16798.84 | $a^3D_{22} - z^3G_3^0$ | | |
| 5948.90 | 0 | - | M | 16805.20 | $z^5G_5^0 - 52$ | | |
| 5941.45 | 1 | - | EV | 16826.26 | $z^5D_4^0 - 47$ | | |
| 5938.547 | tr | - | MF | 16834.48 | $z^7P_4^0 - 52$ | | |
| 5936.653 | 4 | - | MIT | 16839.85 | $z^3F_4^0 - 53$ | | |
| 5932.379 | 15 | - | MIT | 16851.98 | $b^3F_3 - z^5D_3^0$ or $a^3F_2 - z^7D_3^0$ | | |
| 5929.269 | tr | - | MF | 16860.82 | $z^7D_3^0 - 44$ | | |
| 5926.868 | 10 | - | MIT | 16867.65 | $a^3D_1 - z^3D_1^0$ | | |
| 5921.446 | 25 | - | MIT | 16883.10 | $a^3P_2 - z^5D_3^0$ | 1.530 | 1.423 |
| 5919.342 | 20 | - | MIT | 16889.10 | $a^5D_3 - z^7D_4^0$ | | |
| 5910.297 | tr | - | MF | 16914.95 | $b^3F_4 - z^5D_3^0$ | | |
| 5902.259 | tr | - | MF | 16937.98 | $z^7P_4^0 - 53$ | | |
| 5896.899 | tr | - | MF | 16953.38 | $a^3G_5 - z^7F_6^0$ | | |
| 5888.399 | tr | - | MF | 16977.85 | $a^5D_2 - z^7D_3^0$ | | |
| 5887.159 | 2 | - | MF | 16981.43 | $a^3D_3 - z^3F_2^0$ | | |
| 5874.374 | tr | - | MF | 17018.38 | $b^3F_2 - z^5D_2^0$ | | |
| 5862.419 | trb? | - | MF | 17053.09 | 42 - 161? | | |
| 5839.02 | oh | - | M | 17121.41 | $z^3F_3^0 - 56$ | | |
| 5831.243 | tr | - | MF | 17144.26 | $w^5D_4^0 - 63$ | | |
| 5828.411 | 3 | - | MF | 17152.59 | $a^1G_4 - z^3G_3^0$ | | |
| 5828.065 | 6 | - | MIT | 17153.61 | $a^3D_2 - z^3D_2^0$ | | |
| 5825.851 | 2 | - | MF | 17160.13 | $a^5P_1 - z^7D_1^0$ | | |
| 5825.286 | tr | - | MF | 17161.79 | $z^3F_3^0 - 57$ | | |
| 5824.864 | 2 | - | MF | 17163.03 | $z^3F_3^0 - 58$ | | |
| 5814.980 | 25 | - | MIT | 17192.21 | $b^3F_4 - z^5D_4^0$ | | |
| 5812.615 | 3 | - | MF | 17199.20 | $z^3F_3^0 - 59$ | | |
| 5810.881 | tr | - | MF | 17204.34 | $b^3P_1 - z^5S_2^0$ | | |
| 5802.027 | tr | - | MF | 17230.79 | $a^3P_1 - z^3P_0^0$ | | |
| 5798.84 | 1 | - | M | 17240.07 | $a^3D_3 - y^5D_3^0$ | | |
| 5792.234 | 3 | - | MF | 17259.72 | $a^3G_3 - z^5G_2^0$ | | |
| 5790.593 | 3 | - | MF | 17264.61 | $a^5P_3 - z^7D_3^0$ | | |
| 5782.725 | tr | - | MF | 17288.10 | $a^5D_0 - z^7D_1^0$ | | |
| 5782.368 | 3 | - | MF | 17289.17 | $a^3F_2 - z^7D_2^0$ or $a^3D_2 - z^7P_2^0$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman Effect | | | |
|-----------|-----|-----|-------|----------|------------------|---------------|------------------|-------|-------|
| | | | | | | g_1 | g_2 | | |
| 5776.839 | tr | - | MF | 17305.72 | $z^3D_2^{\circ}$ | - | 56 | | |
| 5774.86 | 1 | - | M | 17311.65 | $z^7F_4^{\circ}$ | - | 51 | | |
| 5774.406 | 3 | - | MF | 17313.01 | b^3P_2 | - | $z^5G_2^{\circ}$ | | |
| 5767.920 | 7 | - | MIT | 17332.48 | a^3P_1 | - | $z^5D_1^{\circ}$ | | |
| 5766.117 | tr | - | MF | 17338.00 | a^3D_2 | - | $z^3F_3^{\circ}$ | | |
| 5763.671 | 3 | - | MF | 17345.24 | a^3G_3 | - | $z^3D_3^{\circ}$ | | |
| 5758.728 | 3 | - | MF | 17360.15 | b^3F_3 | - | $z^5D_2^{\circ}$ | | |
| 5756.831 | 6 | - | MIT | 17365.86 | a^3P_0 | - | $z^5D_1^{\circ}$ | | |
| | | | | or | $z^3F_3^{\circ}$ | - | 60 | | |
| 5752.023 | 10 | - | MIT | 17380.38 | a^3F_3 | - | $z^7D_4^{\circ}$ | | |
| 5745.990 | 10 | - | MIT | 17398.63 | b^3P_2 | - | $z^3D_3^{\circ}$ | | |
| 5745.615 | 3 | - | MF | 17399.76 | a^5D_1 | - | $z^7D_2^{\circ}$ | | |
| 5740.552 | 2 | - | MF | 17415.11 | a^5D_2 | - | $z^7D_2^{\circ}$ | | |
| 5736.973 | tr | - | MF | 17425.97 | a^1P_1 | - | $x^5D_2^{\circ}$ | | |
| 5734.433 | 2 | - | MF | 17433.69 | a^3G_4 | - | $z^7P_4^{\circ}$ | | |
| 5732.900 | tr | - | MF | 17438.35 | $z^7F_5^{\circ}$ | - | 51 | | |
| 5731.295 | tr | - | MF | 17443.24 | b^3F_2 | - | $z^5F_3^{\circ}$ | | |
| 5724.815 | 12 | - | MIT | 17462.98 | a^3G_4 | - | $z^5G_5^{\circ}$ | | |
| 5715.873 | tr | - | MF | 17490.30 | $z^7F_4^{\circ}$ | - | 52 | | |
| | | | | or | $z^3F_3^{\circ}$ | - | 61 | | |
| 5702.361 | 15 | - | MIT | 17531.74 | a^3G_4 | - | $z^3F_4^{\circ}$ | | |
| 5699.577 | 10 | - | MIT | 17540.31 | b^3P_2 | - | $z^5S_2^{\circ}$ | | |
| 5699.047 | 125 | - | MIT | 17541.94 | a^5P_3 | - | $z^5D_4^{\circ}$ | 1.623 | 1.483 |
| 5696.352 | 3 | - | MF | 17550.24 | $z^3D_2^{\circ}$ | - | 60 | | |
| 5693.028 | 7 | - | MIT | 17560.18 | a^1P_1 | - | $x^5D_0^{\circ}$ | | |
| 5682.272 | tr | - | MF | 17593.72 | $z^7F_4^{\circ}$ | - | 53 | | |
| 5674.851 | tr | - | MF | 17616.73 | $z^7F_5^{\circ}$ | - | 52 | | |
| 5665.201 | 10 | - | MIT | 17646.74 | a^3G_3 | - | $z^5G_4^{\circ}$ | | |
| 5663.051 | 2 | - | MF | 17653.44 | 42 | - | $z^3S_1^{\circ}$ | | |
| 5653.302 | 4 | - | MIT | 17683.88 | a^3G_5 | - | $z^3G_4^{\circ}$ | | |
| 5652.797 | tr | - | MF | 17685.46 | a^3G_3 | - | $z^7P_3^{\circ}$ | | |
| 5650.812 | 2 | - | MF | 17691.67 | a^1G_4 | - | $z^3F_3^{\circ}$ | | |
| 5649.555 | 7 | - | MIT | 17695.61 | b^3F_4 | - | $z^5F_5^{\circ}$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman Effect | |
|-----------|-----|-----|-------|----------|---|---------------|-------|
| | | | | | | g_1 | g_2 |
| 5647.882 | 3 | - | MF | 17700.85 | $z^3G_3^o - 57$ | | |
| 5647.560 | 3 | - | MF | 17701.86 | $a^5P_3 - z^7D_2^o$ | | |
| 5645.757 | tr | - | MF | 17707.51 | $a^5D_1 - z^7D_1^o$ | | |
| 5641.655 | 7 | - | MIT | 17720.39 | $a^3G_4 - z^5G_3^o$ or $z^7F_5^o - 53$ | | |
| 5640.842 | tr | - | MF | 17722.94 | $a^5D_2 - z^7D_1^o$ | | |
| 5636.235 | 100 | - | MIT | 17737.43 | $a^5D_3 - z^5D_4^o$ | 1.425 | 1.488 |
| 5633.542 | 2 | - | MF | 17745.91 | $z^7F_6^o - 51$ | | |
| 5625.061 | tr | - | MF | 17772.66 | 42 - $y^5P_3^o$ | | |
| 5603.142 | 12 | - | MIT | 17842.19 | $a^3P_2 - z^5D_2^o$ | | |
| 5590.729 | tr | - | MF | 17881.80 | $a^3D_3 - z^5P_3^o$ | | |
| 5685.888 | tr | - | MF | 17897.30 | $a^5D_3 - z^7D_2^o$ | | |
| 5572.277 | tr | - | MF | 17941.01 | $a^3P_0 - z^5F_1^o$ | | |
| 5569.033 | 12 | - | MIT | 17951.47 | $a^3F_3 - z^7D_3^o$ | | |
| 5559.749 | 60 | - | MIT | 17981.44 | $a^5D_4 - z^7D_4^o$ | | |
| 5556.520 | 10 | - | MIT | 17991.89 | $a^5P_2 - z^7D_3^o$ | | |
| 5553.776 | tr | - | MF | 18000.78 | $a^1D_2 - z^5P_1^o$ | | |
| 5541.933 | tr | - | MF | 18039.25 | $z^3G_3^o - 61$ | | |
| 5540.662 | 12 | - | MIT | 18043.38 | $a^3G_5 - z^7P_4^o$ | | |
| 5530.993 | 5 | - | MIT | 18074.93 | 42 - $y^5P_2^o$ | | |
| 5517.842 | 3 | - | MF | 18118.01 | $a^3D_2 - z^3F_2^o$ | | |
| 5510.714 | 100 | - | MIT | 18141.44 | $a^3G_5 - z^3F_4^o$ | 1.188 | 1.274 |
| 5509.196 | tr | - | MF | 18146.44 | $b^3F_2 - z^5F_1^o$ | | |
| 5506.931 | 2 | - | MF | 18153.90 | $a^3G_3 - z^3G_3^o$ | | |
| 5502.20 | 0 | - | M | 18169.49 | $a^3D_1 - z^5P_2^o$ | | |
| 5501.858 | tr | - | MF | 18170.64 | $z^7P_3^o - 58$ | | |
| 5499.632 | tr | - | MF | 18178.00 | $z^7P_2^o - 62$ | | |
| 5496.687 | 15 | - | MIT | 18187.74 | $a^1H_5 - y^3F_4^o$ | | |
| 5490.808 | 2 | - | MF | 18207.21 | $b^3P_2 - z^3G_3^o$ | | |
| 5490.573 | 2 | - | MF | 18207.99 | $z^5G_4^o - 57$ | | |
| 5490.124 | tr | - | MF | 18209.48 | $z^5G_4^o - 58$ | | |
| 5485.147 | 2 | - | MF | 18226.00 | $b^3P_1 - z^3D_2^o$ | | |
| 5484.643 | 10 | - | MIT | 18227.68 | $a^3G_4 - z^3D_3^o$ | | |
| 5484.323 | 60 | - | MIT | 18228.74 | $a^3F_3 - z^5D_4^o$ | | |
| 5483.24 | 2 | - | M | 18232.34 | $a^3P_1 - z^7F_2^o$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman Effect | |
|-----------|-----|-----|-------|----------|---------------------|---------------|--------------------|
| | | | | | | g_1 | g_2 |
| 5482.165 | tr | - | MF | 18235.91 | $b^3F_3 - z^5F_3^o$ | | |
| 5480.513 | 2 | - | MF | 18241.41 | $a^1H_5 - z^3H_5^o$ | | |
| 5479.404 | 40 | - | MIT | 18245.10 | $z^5G_4^o - 59$ | (1.111) | 1.123 a |
| 5472.841 | 4 | - | MIT | 18266.98 | $a^3P_2 - z^5F_3^o$ | | |
| 5463.151 | 2 | - | MF | 18299.38 | $a^3P_1 - z^7F_1^o$ | | |
| 5458.920 | tr | - | MF | 18313.57 | $z^3D_2^o - 62$ | | |
| 5456.134 | 40 | - | MIT | 18322.92 | $a^3F_2 - z^5D_3^o$ | 1.091 | 1.428 |
| 5454.227 | tr | - | MF | 18329.32 | $a^3P_1 - z^7F_0^o$ | | |
| 5452.712 | 7 | - | MIT | 18334.42 | $z^5G_6^o - 51$ | | |
| 5449.478 | tr | - | MF | 18345.30 | $a^1P_1 - z^3S_1^o$ | | |
| 5444.620 | 2 | - | MF | 18361.66 | $b^3P_1 - z^7P_2^o$ | | |
| 5436.624 | 2 | - | MF | 18388.67 | $a^3F_3 - z^7D_2^o$ | | |
| 5429.961 | tr | - | MF | 18411.23 | $z^3G_5^o - 51$ | | |
| 5424.751 | 3 | - | MF | 18428.92 | $a^5P_2 - z^7D_2^o$ | | |
| 5420.100 | 2 | - | MF | 18444.73 | $b^3F_2 - z^7F_3^o$ | | |
| 5418.855 | 20 | - | MIT | 18448.97 | $a^5D_2 - z^5D_3^o$ | | |
| 5407.540 | tr | - | MF | 18487.57 | $z^5G_6^o - 51$ | | |
| 5405.362 | tr | - | MF | 18495.02 | $a^3P_2 - z^5D_1^o$ | | |
| 5401.394 | 20 | - | MIT | 18508.61 | $a^3G_3 - z^3D_2^o$ | | |
| 5395.384 | 2 | - | MF | 18529.22 | $a^3G_4 - z^5G_4^o$ | | |
| 5390.427 | 2 | - | MF | 18546.26 | $z^3D_3^o - 59$ | | |
| 5388.609 | 5 | - | MIT | 18552.52 | $a^5D_4 - z^7D_3^o$ | | |
| 5385.879 | 25 | - | MIT | 18561.92 | $b^3P_2 - z^3D_2^o$ | 1.315 | 1.028 |
| 5384.11 | 1 | - | M | 18568.03 | $a^3G_4 - z^7P_3^o$ | | |
| 5377.839 | 25 | - | MIT | 18589.67 | $z^3G_5^o - 52$ | 1.22 | 1.19 |
| 5365.586 | 3 | - | MF | 18632.13 | $z^5G_2^o - 59$ | | |
| 5362.087 | 4 | - | MIT | 18644.28 | $a^3G_3 - z^7P_2^o$ | | |
| 5355.134 | tr | - | MF | 18668.49 | $z^3G_3^o - 62$ | | |
| 5354.955 | 2 | - | MF | 18669.12 | $a^3F_4 - z^7D_5^o$ | | |
| 5348.605 | tr | - | MF | 18691.28 | $a^3D_3 - z^5P_2^o$ | | |
| 5348.136 | 3 | - | MF | 18692.92 | $a^3G_3 - z^3F_3^o$ | | |
| 5347.206 | 2 | - | MF | 18696.17 | $z^5S_2^o - 61$ | | |
| 5346.798 | tr | - | MF | 18697.60 | $b^3P_2 - z^7P_2^o$ | | |
| 5343.308 | 2 | - | MF | 18709.81 | $a^3H_4 - z^5F_3^o$ | | |
| 5342.225 | tr | - | MF | 18713.60 | $z^3D_3^o - 60$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman ξ_1 | Effect ξ_2 |
|-----------|-----|-----|-------|----------|-------------------|-------------------|-------------------|
| 5335.930 | 100 | - | MIT | 18735.68 | $a^5P_3 - z^5D_3$ | 1.621 | 1.422 |
| 5332.931 | 40 | - | MIT | 18746.21 | $b^3P_2 - z^3F_3$ | | |
| 5331.091 | tr | - | MF | 18752.68 | $b^3P_0 - z^3D_1$ | | |
| 5328.807 | tr | - | MF | 18760.72 | $a^1D_2 - y^5F_3$ | | |
| 5327.133 | 2 | - | MF | 18766.62 | $a^1P_1 - y^5P_2$ | | |
| 5325.352 | tr | - | MF | 18772.89 | $b^3F_3 - z^5F_2$ | | |
| 5323.207 | 3 | - | MF | 18780.46 | $z^5F_3 - 55$ | | |
| 5317.916 | tr | - | MF | 18799.14 | $z^5G_2 - 60$ | | |
| 5316.612 | tr | - | MF | 18803.75 | $a^3P_2 - z^5F_2$ | | |
| 5315.326 | 10 | - | MIT | 18808.30 | 42 - y^3P_2 | | |
| 5309.267 | 125 | - | MIT | 18829.97 | $a^5D_4 - z^5D_4$ | 1.44 | 1.47 |
| 5306.452 | 7 | - | MIT | 18839.76 | 42 - y^5P_1 | | |
| 5305.854 | 7 | - | MIT | 18841.18 | $a^1H_5 - z^3H_6$ | | |
| 5304.860 | 60 | - | MIT | 18845.41 | $a^5P_1 - z^5D_2$ | | |
| 5291.89 | 1 | - | M | 18891.59 | $z^5F_4 - 51$ | | |
| 5291.165 | 25 | - | MIT | 18894.18 | $b^3F_4 - z^5F_4$ | | |
| 5284.090 | 100 | - | MIT | 18919.48 | $a^3F_4 - z^7D_4$ | 1.282 | 1.623 |
| 5280.822 | 12 | - | MIT | 18931.19 | $a^5D_3 - z^5D_3$ | 1.426 | 1.426n |
| 5278.393 | 3 | - | MF | 18939.90 | $b^3F_3 - z^7F_4$ | | |
| 5266.833 | 15 | - | MIT | 18981.47 | $a^1H_5 - x^3F_4$ | | |
| 5266.472 | 12 | - | MIT | 18982.77 | 42 - y^3P_1 | 1.337 | 1.595 |
| 5257.075 | 25 | - | MIT | 19016.71 | $z^5G_3 - 57$ | (0.944) | 1.010n |
| 5251.667 | 25 | - | MIT | 19036.29 | $a^3G_4 - z^3G_3$ | | |
| | | | | or | $z^7P_3 - 62$ | | |
| 5250.459 | tr | - | MF | 19040.67 | $w^3F_4 - 63$ | | |
| 5246.826 | tr | - | MF | 19053.85 | $z^5G_3 - 59$ | | |
| 5242.381 | 10 | - | MIT | 19070.01 | $a^3P_2 - z^5F_1$ | | |
| | | | | or | $z^5F_4 - 52$ | | |
| 5236.955 | tr | - | MF | 19089.77 | $b^3F_2 - z^5G_3$ | | |
| 5223.553 | 20 | - | MIT | 19138.75 | $a^3G_5 - z^5G_4$ | | |
| 5214.077 | 4 | - | MIT | 19173.53 | $z^5F_4 - 53$ | | |
| 5213.428 | 10 | - | MIT | 19175.91 | $z^3G_5 - 55$ | | |
| 5209.501 | 7 | - | MIT | 19190.37 | $b^3P_1 - z^3F_2$ | | |
| 5202.122 | 12 | - | MIT | 19217.59 | $a^1H_5 - z^3H_4$ | | |
| 5197.062 | 3 | - | MF | 19236.30 | $b^3F_3 - z^3G_4$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman Effect | |
|-----------|-----|-----|-------|----------|---------------------------|---------------|--------|
| | | | | | | g_1 | g_2 |
| 5195.408 | tr | - | MF | 19242.42 | $z^3F_4^{\circ} - 59$ | | |
| 5195.019 | 100 | - | MIT | 19243.86 | $a^5P_3 - z^5F_4^{\circ}$ | 1.628 | 1.368 |
| 5193.001 | 2 | - | MF | 19251.31 | $a^3D_1 - y^5F_2^{\circ}$ | | |
| 5189.702 | 2 | - | MF | 19263.58 | $b^3P_0 - y^5D_1^{\circ}$ | | |
| 5188.383 | tr | - | MF | 19268.48 | $a^3P_2 - z^7F_3^{\circ}$ | | |
| 5186.52 | 1 | - | M | 19275.40 | $z^5G_5^{\circ} - 58$ | | |
| 5184.734 | 2 | - | MF | 19282.04 | $a^3F_2 - z^5D_2^{\circ}$ | | |
| 5178.64 | lh | - | M | 19304.72 | $z^7P_4^{\circ} - 58$ | | |
| 5171.028 | 150 | - | MIT | 19333.14 | $a^5D_4 - z^5F_5^{\circ}$ | (1.447) | 1.396n |
| 5159.998 | 12 | - | MIT | 19374.47 | $b^3F_4 - z^3G_5^{\circ}$ | | |
| 5155.136 | 125 | - | MIT | 19392.74 | $a^5D_1 - z^5D_2^{\circ}$ | 1.794 | 1.325 |
| 5154.587 | 3 | - | MF | 19394.81 | $a^3P_2 - z^7F_2^{\circ}$ | | |
| | | | | or | $a^1H_5 - y^3G_5^{\circ}$ | | |
| 5153.205 | 7 | - | MIT | 19400.01 | $a^3P_1 - z^5S_2^{\circ}$ | | |
| 5151.067 | 40 | - | MIT | 19408.06 | $a^5D_2 - z^5D_2^{\circ}$ | 1.233 | 1.323 |
| 5147.237 | 60 | - | MIT | 19422.50 | $a^3F_3 - z^5D_3^{\circ}$ | 1.193 | 1.424 |
| 5142.763 | 25 | - | MIT | 19439.40 | $a^5D_3 - z^5F_4^{\circ}$ | (1.420) | 1.370n |
| 5136.826 | 2 | - | MF | 19461.87 | $a^3P_2 - z^7F_1^{\circ}$ | | |
| 5136.550 | 125 | - | MIT | 19462.91 | $a^5P_2 - z^5D_3^{\circ}$ | 1.559 | 1.424 |
| 5133.886 | 15 | - | MIT | 19473.01 | $a^3G_3 - z^3F_2^{\circ}$ | (0.757) | 1.029p |
| 5129.258 | tr | - | MF | 19490.58 | $a^3F_4 - z^7D_3^{\circ}$ | | |
| 5127.257 | 20 | - | MIT | 19498.19 | $a^5P_1 - z^5D_1^{\circ}$ | | |
| 5126.894 | tr | - | MF | 19499.57 | 42 - $y^3F_2^{\circ}$ | | |
| 5126.757 | 2 | - | MF | 19500.09 | $a^1P_1 - y^3P_2^{\circ}$ | | |
| 5123.728 | 7 | - | MIT | 19511.62 | $b^3F_2 - z^5G_2^{\circ}$ | | |
| 5119.864 | tr | - | MF | 19526.34 | $b^3P_2 - z^3F_2^{\circ}$ | | |
| 5107.067 | 40 | - | MIT | 19575.27 | $a^3G_4 - z^3F_3^{\circ}$ | | |
| 5101.717 | 7 | - | MIT | 19595.80 | $b^3F_3 - z^7P_4^{\circ}$ | | |
| 5101.387 | 20 | - | MIT | 19597.07 | $b^3F_2 - z^3D_3^{\circ}$ | | |
| 5093.826 | 60 | - | MIT | 19626.16 | $a^5D_0 - z^5D_1^{\circ}$ | 0/0 | 0.953n |
| 5083.977 | tr | - | MF | 19664.18 | $z^3G_4^{\circ} - 58$ | | |
| 5079.445 | 4 | - | MIT | 19681.72 | $z^5D_3^{\circ} - 53$ | | |
| 5076.318 | 40 | - | MIT | 19693.84 | $b^3F_3 - z^3F_4^{\circ}$ | | |
| 5076.072 | 15 | - | MIT | 19694.80 | $a^5P_3 - z^5D_2^{\circ}$ | | |
| 5072.971 | 25 | - | MIT | 19706.84 | $a^3F_2 - z^5F_3^{\circ}$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman g_1 | Effect g_2 |
|-----------|-----|-----|-------|----------|---------------------|-----------------|-----------------|
| 5070.990 | 2 | - | MF | 19714.54 | $a^1D_2 - x^5D_3^0$ | | |
| 5064.775 | 2 | - | MF | 19738.73 | $b^3F_2 - z^5S_2^0$ | | |
| 5062.642 | 10 | - | MIT | 19747.04 | $b^3P_1 - y^5D_2^0$ | | |
| 5057.331 | 100 | - | MIT | 19767.78 | $a^3F_4 - z^5D_4^0$ | 1.280 | 1.485 |
| 5056.813 | tr | - | MF | 19769.81 | $b^3F_4 - z^5F_3^0$ | | |
| 5055.907 | 2 | - | MF | 19773.35 | $a^3D_3 - y^5F_2^0$ | | |
| 5052.949 | 5 | - | MIT | 19784.92 | $b^3P_2 - y^5D_3^0$ | | |
| 5047.312 | 10 | - | MIT | 19807.02 | $a^5P_1 - z^5F_2^0$ | | |
| 5040.744 | 10 | - | MIT | 19832.83 | $a^5D_2 - x^5F_3^0$ | | |
| 5040.353 | 7 | - | MIT | 19834.36 | $42 - x^3D_3^0$ | | |
| 5032.882 | tr | - | MF | 19863.81 | $z^7F_2^0 - 61$ | | |
| 5028.16 | 12 | - | MIT | 19882.46 | $b^3F_3 - z^5G_3^0$ | | |
| 5026.175 | 15 | - | MF | 19890.32 | $a^5D_3 - z^5D_2^0$ | | |
| 5020.305 | 6 | - | MIT | 19913.57 | $a^3P_2 - z^5G_3^0$ | | |
| 5018.859 | 3 | - | MF | 19919.31 | $a^1D_2 - y^3D_3^0$ | | |
| 5016.008 | tr | - | MF | 19930.63 | $a^3F_3 - z^5F_4^0$ | | |
| 5014.954 | 20 | - | MIT | 19934.84 | $a^3F_2 - z^5D_1^0$ | 1.094 | 0.963 |
| 5014.324 | tr | - | MF | 19937.23 | $b^3F_2 - z^7P_3^0$ | | |
| 5011.227 | 25 | - | MIT | 19949.64 | $a^5P_1 - z^5D_0^0$ | 1.980 | 0/0 n |
| 5008.816 | 12 | - | MF | 19959.25 | $z^7F_4^0 - 57$ | | |
| 5002.627 | 2 | - | MF | 19983.94 | $z^5G_3^0 - 62$ | | |
| 4999.552 | 6 | - | MIT | 19996.23 | $z^7F_4^0 - 59$ | | |
| 4992.736 | 25 | - | MIT | 20023.53 | $a^5D_4 - z^5D_3^0$ | | |
| 4991.20 | 1 | - | M | 20029.69 | $a^3G_3 - y^5D_2^0$ | | |
| 4987.262 | 15 | - | MIT | 20045.51 | $a^5D_1 - z^5D_1^0$ | | |
| 4983.449 | 7 | - | MIT | 20060.84 | $a^5D_2 - z^5D_1^0$ | | |
| 4980.354 | 60 | - | MIT | 20073.31 | $a^5P_1 - z^5F_1^0$ | | |
| 4978.000 | 3 | - | MF | 20082.80 | $42 - x^3D_1^0$ | | |
| 4977.212 | tr | - | MF | 20085.98 | $z^5F_2^0 - 56$ | | |
| 4976.197 | 40 | - | MIT | 20090.08 | $z^5F_5^0 - 51$ | | |
| 4971.418 | 2 | - | MF | 20109.39 | $b^3P_1 - y^5D_1^0$ | | |
| 4968.908 | 40 | - | MIT | 20119.56 | $a^5P_3 - z^5F_3^0$ | | |
| 4957.842 | 10 | - | MIT | 20164.45 | $z^5D_3^0 - 55$ | | |
| 4951.246 | 2 | - | MF | 20191.24 | $a^1P_1 - y^3F_2^0$ | | |
| 4948.806 | 2 | - | MF | 20201.27 | $a^5D_0 - z^5F_1^0$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman Effect | |
|-----------|-----|-----|-------|----------|-------------------|---------------|-------|
| | | | | | | g_1 | g_2 |
| 4944.403 | 2 | - | MF | 20219.26 | $b^3P_0 - z^5P_1$ | | |
| 4943.997 | 3 | - | MF | 20220.92 | $a^1H_5 - z^1G_4$ | | |
| 4938.434 | 60 | - | MIT | 20243.70 | $a^3F_2 - z^5F_2$ | | |
| 4937.080 | 2 | - | MF | 20249.25 | $42 - w^3F_2$ | | |
| 4936.231 | 6 | - | MIT | 20252.73 | $a^3D_1 - y^3D_2$ | | |
| 4932.383 | tr | - | MF | 20268.53 | $z^5F_5 - 52$ | | |
| 4931.735 | 2 | - | MF | 20271.20 | $a^3F_4 - z^5F_5$ | | |
| 4924.531 | 2 | - | MF | 20300.85 | $a^1D_2 - z^3P_1$ | | |
| 4923.736 | 2 | - | MF | 20304.13 | $b^3F_3 - z^5G_2$ | | |
| 4921.074 | 40 | - | MIT | 20315.11 | $a^5D_3 - z^5F_3$ | 1.417 | 1.297 |
| 4919.654 | 3 | - | MF | 20320.97 | $a^1D_2 - z^3P_1$ | | |
| 4918.359 | 3 | - | MF | 20326.33 | $42 - w^3F_3$ | | |
| 4917.354 | 4 | - | MIT | 20330.48 | $z^5F_2 - 60$ | | |
| 4913.265 | 5 | - | MIT | 20347.40 | $b^3F_4 - z^7F_5$ | | |
| 4911.593 | 10 | - | MIT | 20354.33 | $a^5D_1 - z^5F_2$ | | |
| 4907.888 | 20 | - | MIT | 20369.69 | $a^5D_2 - z^5F_2$ | 1.24 | 1.17 |
| 4905.022 | 12 | - | MIT | 20381.60 | $a^3F_3 - z^5D_2$ | | |
| 4904.551 | 3 | - | MF | 20383.55 | $a^1H_5 - y^3G_4$ | | |
| 4903.053 | 60 | - | MIT | 20389.78 | $b^3F_3 - z^3D_3$ | 1.081 | 1.201 |
| 4901.862 | 5 | - | MIT | 20394.72 | $z^5D_1 - 56$ | | |
| 4901.066 | 7 | - | MIT | 20398.05 | $b^3P_1 - y^5D_0$ | | |
| | | | | or | $a^5P_1 - z^7F_2$ | | |
| 4899.252 | 12 | - | MIT | 20405.60 | $b^3F_2 - z^3G_3$ | | |
| 4895.597 | 12 | - | MIT | 20420.83 | $a^3P_2 - z^3D_3$ | 1.541 | 1.206 |
| 4895.418 | 4 | - | MF | 20421.58 | $a^3P_1 - z^3D_2$ | | |
| 4895.320 | 10 | - | MIT | 20421.99 | $a^5P_2 - z^5D_2$ | | |
| 4894.211 | 3 | - | MF | 20426.61 | $b^3P_2 - z^5P_3$ | | |
| 4889.753 | 3 | - | MF | 20445.24 | $b^3P_2 - y^5D_1$ | | |
| 4885.006 | 7 | - | MIT | 20465.11 | $a^5P_1 - z^7F_1$ | | |
| 4882.889 | 3 | - | MF | 20473.98 | $b^3F_4 - z^7F_4$ | | |
| 4877.882 | 7 | - | MIT | 20494.99 | $a^5P_1 - z^7F_0$ | | |
| 4877.403 | 7 | - | MIT | 20496.98 | $a^5D_1 - z^5D_0$ | | |
| 4876.034 | 3 | - | MF | 20502.76 | $z^7F_2 - 62$ | | |
| 4874.326 | 10 | - | MIT | 20509.94 | $a^3F_2 - z^5F_1$ | | |

| λ | Arc | Spk | Auth. | ω | Comb. | Zeeman Effect | |
|-----------|-----|-----|-------|----------|------------------------|---------------|-------|
| | | | | | | g_1 | g_2 |
| 4869.153 | 125 | - | MIT | 20531.74 | $a^5D_4 - z^5F_4^o$ | 1.446 | 1.364 |
| 4865.088 | 12 | - | MIT | 20548.89 | 42 - $x^3F_3^o$ | | |
| 4863.111 | 10 | - | MIT | 20557.24 | $a^3P_1 - z^7P_2^o$ | | |
| 4862.349 | 2 | - | MF | 20560.47 | $a^1H_5 - z^1H_5^o$ | | |
| 4861.867 | 15 | - | MIT | 20562.51 | $a^3P_2 - z^5S_2^o$ | | |
| 4860.162 | 4 | - | MIT | 20569.72 | $a^3D_3 - x^5D_3^o$ | | |
| 4859.262 | 3 | - | MF | 20573.53 | $a^1D_2 - y^3D_1^o$ | | |
| 4854.564 | 10 | - | MIT | 20593.44 | $z^5D_4^o - 51$ | | |
| 4848.16 | 6 | - | MIT | 20620.65 | $a^5D_1 - z^5F_1^o$ | | |
| 4847.858 | 5 | - | MIT | 20621.93 | $a^1D_2 - x^5D_2^o$ | | |
| 4845.91 | 4 | - | MIT | 20630.21 | $a^3G_4 - y^5D_4^o$ | | |
| 4844.993 | 2 | - | MF | 20634.12 | $a^3D_1 - z^3P_1^o$ | | |
| 4844.557 | 20 | - | MIT | 20635.98 | $a^5D_2 - z^5F_1^o$ | 1.232 | 0.567 |
| 4843.746 | 5 | - | MIT | 20639.43 | $z^5D_1^o - 60$ | | |
| 4839.767 | 12 | - | MIT | 20656.42 | $a^5P_3 - z^5F_2^o$ | | |
| 4838.162 | 5 | - | MIT | 20663.25 | $z^5F_3^o - 57$ | | |
| 4831.632 | 3 | - | MF | 20691.18 | $b^3F_3 - z^5G_4^o$ | | |
| 4822.568 | 10 | - | MIT | 20730.06 | $b^3F_3 - z^7P_3^o$ | | |
| 4817.341 | 10 | - | MIT | 20752.56 | $a^3D_2 - y^5F_3^o$ | | |
| 4815.523 | 20 | - | MIT | 20760.37 | $b^3F_2 - z^3D_2^o$ | 0.765 | 1.032 |
| | | | | | or $a^3D_1 - z^3P_0^o$ | | |
| 4814.719 | 4 | - | MIT | 20763.86 | $z^5D_1^o - 61$ | | |
| 4813.226 | 6 | - | MIT | 20770.30 | $b^3F_4 - z^3G_4^o$ | | |
| 4812.203 | 5 | - | MIT | 20774.72 | $a^3D_3 - y^3D_2^o$ | | |
| | | | | | or $a^1P_1 - x^3D_1^o$ | | |
| 4804.884 | 20 | - | MIT | 20806.36 | $a^3F_3 - z^5F_3^o$ | | |
| 4801.176 | 10 | - | MIT | 20822.43 | 42 - $w^3D_2^o$ | | |
| 4798.443 | 25 | - | MIT | 20834.29 | $a^5D_2 - z^7F_3^o$ | | |
| 4795.568 | 20 | - | MIT | 20846.78 | $a^5P_2 - z^5F_3^o$ | | |
| 4794.384 | 25 | - | MIT | 20851.93 | $a^5D_3 - z^5F_2^o$ | | |
| 4793.753 | 2 | - | MF | 20854.67 | $z^5F_5^o - 55$ | | |
| 4790.828 | 3 | - | MF | 20867.40 | $z^5F_3^o - 60$ | | |
| 4784.269 | 25 | - | MIT | 20896.01 | $b^3F_2 - z^7P_2^o$ | | |
| 4783.287 | 10 | - | MIT | 20900.30 | $b^3P_1 - z^5P_2^o$ | | |
| 4781.760 | 12 | - | MIT | 20906.98 | $a^3D_1 - y^3D_1^o$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman Effect | |
|-----------|-----|-----|-------|----------|-------------------|---------------|--------|
| | | | | | | g_1 | g_2 |
| 4781.110 | 7 | - | MIT | 20909.82 | $a^3D_2 - y^5F_0$ | | |
| 4776.882 | 2 | - | MF | 20928.32 | $a^3D_3 - z^3P_0$ | | |
| 4773.997 | 15 | - | MIT | 20940.97 | $a^1P_1 - w^3F_0$ | (0.927) | 0.900n |
| 4773.151 | 15 | - | MIT | 20944.68 | $b^3F_2 - z^3F_0$ | | |
| 4770.727 | 2 | - | MF | 20955.32 | $a^3D_1 - x^5D_0$ | | |
| 4769.515 | 3 | - | MF | 20960.65 | $a^5D_2 - z^7F_0$ | | |
| 4769.303 | 20 | - | MIT | 20961.58 | $a^3F_4 - z^5D_0$ | | |
| 4757.841 | 125 | - | MIT | 21012.08 | $a^5D_4 - z^3G_0$ | 1.445 | 1.230 |
| 4756.233 | 40 | - | MIT | 21019.18 | $a^5D_3 - z^7F_4$ | | |
| 4754.296 | 2 | - | MF | 21027.75 | $a^5D_2 - z^7F_1$ | | |
| 4749.809 | 3 | - | MF | 21047.61 | $z^5D_0 - 56$ | | |
| 4745.859 | 3 | - | MF | 21065.13 | $b^3P_1 - z^5P_1$ | | |
| 4743.994 | 4 | - | MIT | 21073.41 | 42 - x^3D_0 | | |
| 4743.680 | 3 | - | MF | 21074.81 | $a^5P_2 - z^5D_1$ | | |
| 4740.331 | 7 | - | MIT | 21089.69 | $a^3D_1 - x^5D_0$ | | |
| 4739.388 | 2 | - | MF | 21093.89 | $z^5F_0 - 62$ | | |
| 4736.592 | 3 | - | MF | 21106.34 | $a^1G_4 - y^5F_0$ | | |
| 4733.521 | 40 | - | MIT | 21120.03 | $a^5P_3 - z^3G_0$ | | |
| 4733.307 | 6 | - | MF | 21120.99 | $a^5P_3 - z^7F_0$ | | |
| 4731.334 | 60 | - | MIT | 21129.80 | $b^3F_4 - z^7P_4$ | | |
| 4727.590 | 6 | - | MIT | 21146.53 | $a^3H_4 - y^3F_4$ | | |
| 4725.801 | 3 | - | MF | 21154.53 | $a^1D_2 - x^5D_1$ | | |
| 4724.795 | 10 | - | MIT | 21159.02 | $b^3F_4 - z^5G_0$ | | |
| 4720.925 | 15 | - | MIT | 21176.38 | $a^3D_3 - y^3D_0$ | | |
| 4716.045 | 10 | - | MIT | 21198.30 | $b^3F_3 - z^3G_0$ | | |
| 4715.612 | 4 | - | MIT | 21200.24 | $a^3H_4 - z^3H_0$ | | |
| 4709.484 | 80 | - | MIT | 21227.83 | $b^3F_4 - z^3F_0$ | 1.259 | 1.274 |
| 4709.152 | 3 | - | MF | 21229.32 | $a^3P_2 - z^3G_0$ | | |
| 4707.641 | 3 | - | MF | 21236.14 | $b^3P_2 - z^5P_0$ | | |
| 4705.159 | 5 | - | MIT | 21247.34 | $a^5P_3 - z^7F_0$ | | |
| 4695.242 | 10 | - | MIT | 21292.22 | $z^5D_0 - 60$ | | |
| 4690.106 | 25 | - | MIT | 21315.53 | $a^5D_3 - z^3G_0$ | | |
| 4689.889 | 5 | - | MIT | 21316.52 | $a^5D_3 - z^7F_0$ | | |
| 4685.055 | 3 | - | MF | 21338.51 | $a^5P_1 - z^5G_0$ | | |
| 4684.018 | 100 | - | MIT | 21343.24 | $a^3F_3 - z^5F_0$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman Effect | |
|-----------|-----|-----|-------|----------|-------------------|---------------|----------|
| | | | | | | g_1 | g_2 |
| 4681.786 | 100 | - | MIT | 21353.41 | $a^3F_2 - z^5G_3$ | 1.092 | 0.947 |
| 4680.738 | tr | - | MF | 21358.19 | $z^5D_4 - 55$ | | |
| 4674.654 | 20 | - | MIT | 21385.99 | $a^3P_1 - z^3F_2$ | | |
| 4671.370 | 5 | - | MIT | 21401.03 | $b^3P_2 - z^5P_1$ | | |
| 4670.987 | 2 | - | MF | 21402.78 | $z^5D_1 - 62$ | | |
| 4669.977 | 40 | - | MIT | 21407.41 | $a^5D_4 - z^5F_3$ | | |
| 4669.138 | 15 | - | MIT | 21411.25 | $b^3P_0 - y^5F_1$ | | |
| 4668.007 | tr | - | MF | 21416.44 | $b^3F_4 - z^5G_3$ | | |
| 4662.493 | 7 | - | MIT | 21441.77 | $z^7D_4 - 51$ | | |
| 4662.241 | 5 | - | MIT | 21442.93 | $a^5D_3 - z^7F_2$ | | |
| 4656.420 | 12 | - | MIT | 21469.73 | $a^3F_4 - z^5F_4$ | | |
| 4654.795 | 7 | - | MIT | 21477.23 | $a^3D_3 - x^5D_2$ | | |
| 4654.315 | 125 | - | MIT | 21479.45 | $a^5D_2 - z^5G_3$ | 1.237 | 0.945 |
| | | | | or | $a^5P_3 - z^7P_4$ | | |
| 4653.744 | 10 | - | MIT | 21482.08 | 42 - z^1P_1 | | |
| 4652.501 | 5 | - | MIT | 21487.82 | $a^3D_1 - x^5D_1$ | | |
| 4647.606 | 125 | - | MIT | 21510.45 | $a^3F_3 - z^7F_4$ | 1.198 | 1.366 |
| 4646.802 | 6 | - | MIT | 21514.17 | $a^1P_1 - w^3D_2$ | | |
| 4645.089 | 100 | 30 | MIT | 21522.10 | $a^1H_5 - z^3I_6$ | 1.005 | (1.013)n |
| 4640.985 | 10 | - | MIT | 21541.14 | $a^1D_2 - z^3S_1$ | | |
| 4638.428 | 10 | - | MIT | 21553.01 | $b^3F_3 - z^3D_2$ | | |
| 4635.690 | 125 | - | MIT | 21565.74 | $a^5P_1 - z^5S_2$ | | |
| 4633.483 | 5 | - | MIT | 21576.01 | $z^5F_4 - 59$ | | |
| 4633.171 | 5 | - | MIT | 21577.41 | $a^5P_3 - z^3F_4$ | | |
| 4631.738 | 3 | - | MIT | 21584.14 | $a^3P_2 - z^3D_2$ | | |
| 4628.333 | 10 | - | MIT | 21600.02 | 42 - x^3F_2 | | |
| 4623.992 | 2 | - | MIT | 21620.30 | $z^7D_3 - 52$ | | |
| 4617.665 | 12 | - | MIT | 21649.92 | $a^5P_2 - z^5F_1$ | | |
| 4612.325 | 15 | - | MIT | 21674.99 | $a^5D_3 - z^7P_4$ | | |
| 4610.502 | 7 | - | MIT | 21683.56 | $a^1H_5 - x^3G_5$ | | |
| 4608.675 | 6 | - | MIT | 21692.15 | $z^7D_5 - 51$ | | |
| 4605.665 | 15 | - | MIT | 21706.33 | $a^3D_2 - x^5D_3$ | 1.162 | 1.425 |
| 4602.808 | 15 | - | MIT | 21719.80 | $a^3P_2 - z^7P_2$ | | |
| 4601.763 | 20 | - | MIT | 21724.73 | $b^3F_2 - z^3F_2$ | 0.766 | 1.019 |
| 4599.085 | 100 | - | MIT | 21737.38 | $b^3F_3 - z^3F_3$ | 1.087 | 1.129 |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman Effect | |
|-----------|-------|-----|-------|----------|---------------------|---------------|--------|
| | | | | | | g_1 | g_2 |
| 4593.213 | 7 | - | MIT | 21765.17 | $a^1P_1 - x^3D_2^o$ | | |
| 4593.025 | 6 | - | MIT | 21766.07 | $a^5P_3 - z^5G_3^o$ | | |
| 4592.520 | 100 | - | MIT | 21768.46 | $a^3F_2 - z^3F_3^o$ | 1.535 | 1.129 |
| 4591.560 | 20 | - | MIT | 21773.01 | $a^5D_3 - z^3F_4^o$ | | |
| 4591.103 | 60 | - | MIT | 21775.19 | $a^3F_2 - z^5G_2^o$ | 1.087 | 0.377 |
| 4587.099 | 10 | - | MIT | 21794.18 | $a^3P_1 - z^3D_1^o$ | | |
| 4584.445 | 150R | 80 | MIT | 21806.80 | $a^3F_3 - z^3G_4^o$ | | |
| 4580.072 | 25 | - | MIT | 21827.62 | $a^3P_0 - z^3D_1^o$ | 0/0 | 0.520n |
| 4577.000 | 3 | - | MF | 21842.27 | $a^1G_4 - x^5D_4^o$ | | |
| 4575.751 | 7 | - | MIT | 21848.23 | $a^5P_2 - z^7F_3^o$ | | |
| 4570.248 | 10 | - | MIT | 21874.54 | $a^3D_1 - z^3S_1^o$ | | |
| 4567.906 | 7 | - | MIT | 21885.75 | $a^5D_1 - z^5G_2^o$ | | |
| 4564.691 | 20 | - | MIT | 21901.17 | $a^5D_2 - z^5G_2^o$ | | |
| 4562.597 | 15 | - | MIT | 21911.22 | $a^3D_2 - y^3D_2^o$ | | |
| 4559.982 | 20 | - | MIT | 21923.79 | $b^3F_4 - z^3D_3^o$ | 1.246 | 1.196 |
| 4557.814 | 5 | - | MIT | 21934.21 | $a^3F_3 - z^7F_2^o$ | | |
| 4556.065 | 3 | - | MF | 21942.63 | $a^3P_1 - y^5D_2^o$ | | |
| 4554.509 | 1000R | 200 | MIT | 21950.13 | $a^3F_4 - z^3G_5^o$ | | |
| 4552.325 | 3 | - | MF | 21960.66 | 42 - $w^3D_1^o$ | | |
| 4552.110 | 7 | - | MIT | 21961.70 | $a^5D_3 - z^5G_3^o$ | 1.419 | 0.938 |
| 4551.913 | 2 | - | MF | 21962.65 | $a^1D_2 - y^3P_2^o$ | | |
| 4549.427 | 10 | - | MIT | 21974.65 | $a^5P_2 - z^7F_2^o$ | | |
| 4547.853 | 20 | - | MIT | 21982.25 | $b^3P_1 - y^5F_2^o$ | 1.440 | 1.065 |
| 4547.638 | 3 | - | MF | 21983.30 | $b^3F_2 - y^5D_3^o$ | | |
| 4547.33 | 25 | - | MIT | 21984.79 | $a^5D_4 - z^7F_5^o$ | | |
| 4546.930 | 15 | - | MIT | 21986.72 | $a^5D_2 - z^3D_3^o$ | | |
| 4543.687 | 15 | - | MIT | 22002.41 | $a^3F_2 - z^5S_2^o$ | | |
| 4535.587 | 12 | - | MIT | 22041.70 | $a^5P_2 - z^7F_1^o$ | | |
| 4534.490 | 6 | - | MIT | 22047.04 | $z^5D_3^o - 57$ | | |
| 4533.292 | 3 | - | MF | 22052.86 | $a^3D_3 - y^3F_4^o$ | | |
| 4532.446 | 7 | - | MIT | 22056.98 | $a^3H_5 - z^3H_5^o$ | | |
| 4531.801 | 5 | - | MIT | 22060.12 | $a^1G_4 - x^5D_3^o$ | | |
| 4530.854 | 60 | - | MIT | 22064.73 | 42 - $y^1F_3^o$ | 1.343 | 1.000 |
| | | | | or | $a^3D_2 - z^3P_2^o$ | | |
| 4526.843 | 2 | - | MF | 22084.28 | $z^5D_3^o - 58$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman g_1 | Effect g_2 |
|-----------|-----|-----|-------|----------|---------------------|-----------------|-----------------|
| 4521.262 | 3 | - | MF | 22111.54 | $a^5D_4 - z^7F_4^o$ | | |
| 4520.950 | 25 | - | MIT | 22113.06 | $a^5D_1 - z^5S_2^o$ | 1.795 | 2.033 |
| 4517.818 | 60 | - | MIT | 22128.39 | $a^5D_2 - z^5S_2^o$ | 1.232 | 2.032 |
| 4516.893 | 100 | - | MIT | 22132.93 | $b^3F_2 - z^3D_1^o$ | 0.763 | 0.521 |
| 4511.197 | 25 | - | MIT | 22160.87 | $b^3P_2 - y^5F_3^o$ | | |
| 4510.097 | 25 | - | MIT | 22166.28 | $a^3F_3 - z^7P_4^o$ | 1.189 | 1.651 |
| 4508.561 | 15 | - | MIT | 22173.83 | $a^1P_1 - z^1P_1^o$ | 0.93 | 0.93 n |
| 4508.039 | 12 | - | MIT | 22176.39 | $a^3H_4 - z^3H_4^o$ | | |
| 4505.691 | 4 | - | MF | 22187.95 | $a^5P_3 - z^5G_2^o$ | | |
| 4503.040 | 3 | - | MF | 22201.01 | $a^3F_2 - z^7P_3^o$ | | |
| 4498.145 | 125 | - | MIT | 22225.17 | $b^3F_4 - z^5G_4^o$ | 1.256 | 1.114 |
| 4492.892 | 7 | - | MIT | 22251.16 | $z^5D_3^o - 60$ | | |
| 4491.682 | 20 | - | MIT | 22257.15 | $b^3P_1 - y^5F_1^o$ | | |
| 4490.235 | 25 | - | MIT | 22264.32 | $a^3F_3 - z^3F_4^o$ | | |
| 4488.392 | 25 | - | MIT | 22273.47 | $a^5P_3 - z^3D_3^o$ | | |
| 4486.812 | 6 | - | MIT | 22281.31 | $b^3F_2 - y^5D_2^o$ | | |
| 4484.695 | 5 | - | MF | 22291.84 | $a^1P_1 - x^3F_2^o$ | | |
| 4482.034 | 12 | - | MIT | 22305.06 | $a^3P_1 - y^5D_1^o$ | | |
| 4480.448 | 60 | - | MIT | 22312.96 | $a^3D_2 - y^3D_3^o$ | 1.162 | 1.384 |
| 4479.410 | 15 | - | MIT | 22318.13 | $b^3P_2 - y^5F_2^o$ | | |
| 4477.626 | 2 | - | MF | 22327.02 | $a^5D_2 - z^7P_3^o$ | | |
| 4475.660 | 5 | - | MF | 22336.83 | $a^3H_4 - y^3F_3^o$ | | |
| 4475.330 | 10 | - | MIT | 22338.47 | $a^3P_0 - y^5D_1^o$ | | |
| 4473.928 | 100 | - | MIT | 22345.47 | $a^3F_4 - z^5F_3^o$ | | |
| 4472.271 | 7 | - | MF | 22353.75 | $a^3H_4 - y^3G_5^o$ | | |
| 4467.260 | 20 | - | MIT | 22378.83 | $a^1P_1 - z^1S_0^o$ | 0.926 | 0/0 n |
| 4466.343 | 15 | - | MIT | 22383.43 | $a^5D_3 - z^5G_2^o$ | | |
| 4465.482 | 15 | - | MIT | 22387.73 | $a^1D_2 - y^3F_3^o$ | | |
| 4461.474 | 10 | - | MF | 22407.85 | $a^5D_4 - z^3G_4^o$ | | |
| 4460.035 | 150 | 80 | MIT | 22415.08 | $a^5P_3 - z^5S_2^o$ | 1.627 | 2.035 |
| 4452.516 | 5 | - | MF | 22452.93 | $a^3F_3 - z^5G_3^o$ | | |
| 4449.336 | 125 | 100 | MIT | 22468.98 | $a^5D_3 - z^3D_3^o$ | 1.419 | 1.203 |
| 4444.507 | 40 | - | MIT | 22493.38 | $a^5P_2 - z^5G_3^o$ | 1.569 | 0.942 |
| 4440.082 | 10 | - | MF | 22515.81 | $a^3D_3 - y^5P_3^o$ | | |
| 4439.761 | 125 | 50 | MIT | 22517.44 | $b^3F_3 - z^3F_2^o$ | (1.086) | 1.024 n |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman Effect | |
|-----------|------|-----|-------|----------|------------------------|---------------|--------|
| | | | | | | g_1 | g_2 |
| 4433.646 | 10 | - | MF | 22548.49 | $a^3P_2 - z^3F_2^o$ | | |
| 4430.311 | 20 | - | MIT | 22565.46 | $a^3D_2 - y^3D_1^o$ | | |
| | | | | | or $a^3G_5 - y^5F_5^o$ | | |
| 4428.461 | 125 | - | MIT | 22574.89 | $a^5P_3 - z^5G_4^o$ | 1.623 | 1.114 |
| 4426.013 | 10 | - | MIT | 22587.38 | $a^5P_1 - z^3D_2^o$ | | |
| 4424.781 | 25 | - | MIT | 22593.66 | $a^3P_1 - y^5D_0^o$ | 1.680 | 0/0 n |
| 4421.456 | 60 | - | MIT | 22610.66 | $a^5D_3 - z^5S_2^o$ | 1.420 | 2.035 |
| 4420.841 | 40 | - | MIT | 22613.80 | $a^3D_2 - x^5D_2^o$ | | |
| | | | | | or $a^5P_3 - z^7P_3^o$ | | |
| 4418.624 | 5 | - | MF | 22625.15 | $b^3F_2 - z^5P_3^o$ | | |
| 4414.993 | 10 | - | MF | 22643.75 | $b^3F_2 - y^5D_1^o$ | | |
| 4413.291 | 12 | - | MIT | 22652.49 | $a^1P_1 - w^3D_1^o$ | | |
| 4412.331 | 6 | - | MF | 22657.42 | $a^3H_5 - z^3H_6^o$ | | |
| 4410.527 | 3 | - | MF | 22666.68 | $a^1G_4 - y^3D_3^o$ | | |
| 4410.026 | 150 | 80 | MIT | 22669.26 | $a^3F_2 - z^3G_3^o$ | 1.087 | 0.869 |
| 4404.818 | 25 | - | MF | 22696.06 | $a^1D_2 - y^3P_2^o$ | 1.174 | 1.294 |
| 4399.587 | 20 | - | MIT | 22723.04 | $a^5P_1 - z^7P_2^o$ | | |
| 4398.719 | 6 | - | MF | 22727.53 | $a^1D_2 - y^5P_1^o$ | | |
| 4397.797 | 150 | - | MIT | 22732.29 | $b^3F_4 - z^3G_3^o$ | 1.257 | 0.870 |
| 4396.686 | 7 | - | MIT | 22738.04 | $z^5F_5^o - 58$ | | |
| 4394.959 | 15 | - | MIT | 22746.97 | $a^3H_6 - z^3H_5^o$ | (1.164) | 1.047p |
| 4391.027 | 20 | - | MIT | 22767.34 | $a^5D_4 - z^7P_4^o$ | | |
| 4390.435 | 150R | 80 | MIT | 22770.41 | $a^5D_3 - z^5G_4^o$ | 1.417 | 1.114 |
| 4389.345 | 4 | - | MF | 22776.07 | $b^3F_3 - y^5D_3^o$ | | |
| 4386.272 | 20 | - | MIT | 22792.01 | $b^3P_0 - y^3D_1^o$ | | |
| 4385.648 | 125 | 50 | MIT | 22795.27 | $a^5D_2 - z^3G_3^o$ | 1.226 | 0.865 |
| 4385.391 | 125 | 40 | MIT | 22796.60 | $a^5D_4 - z^5G_5^o$ | 1.447 | 1.265 |
| 4383.360 | 12 | - | MIT | 22807.16 | $a^3P_2 - y^5D_3^o$ | | |
| 4382.945 | 4 | - | MF | 22809.32 | $a^5D_3 - z^7P_3^o$ | | |
| 4381.266 | 15 | - | MIT | 22818.06 | $a^3D_3 - y^5P_2^o$ | | |
| 4376.343 | 4 | - | MF | 22843.73 | $a^3G_3 - x^5D_4^o$ | | |
| 4375.799 | 2 | - | MF | 22846.57 | $a^3D_3 - x^3F_4^o$ | | |
| 4372.208 | 125 | 100 | MIT | 22865.34 | $a^5D_4 - z^5F_4^o$ | 1.446 | 1.276 |
| | | | | | or $a^1P_1 - y^3S_1^o$ | | |
| 4371.201 | 15 | 5 | MIT | 22870.60 | $a^1D_2 - y^3P_1^o$ | | |
| 4370.415 | 15 | - | MIT | 22874.71 | $a^3F_3 - z^5G_2^o$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman g_1 | Effect g_2 |
|-----------|-----|-----|-------|----------|--|-----------------|-----------------|
| 4364.104 | 6 | - | MIT | 22907.79 | 42 - v ³ D ₁ ^o | (1.343) | 0.796p |
| 4362.702 | 6 | - | MIT | 22915.16 | a ⁵ P ₂ - z ⁵ G ₂ ^o | | |
| 4361.211 | 40 | 50 | MIT | 22922.93 | a ³ F ₄ - z ⁷ F ₅ ^o | 1.281 | 1.474 |
| 4354.802 | 12 | - | MIT | 22956.73 | a ³ P ₂ - z ³ D ₁ ^o | 1.534 | 0.519 |
| 4354.131 | 25 | 20 | MIT | 22960.26 | a ³ F ₃ - z ³ D ₃ ^o | 1.20 | 1.20 |
| 4349.698 | 20 | - | MIT | 22983.66 | b ³ P ₁ - y ³ D ₂ ^o | 1.442 | 1.173 |
| 4348.517 | 2 | - | MF | 22989.90 | a ³ G ₄ - y ⁵ F ₃ ^o | | |
| 4346.476 | 15 | - | MIT | 23000.70 | a ⁵ P ₂ - z ³ D ₃ ^o | 1.567 | 1.206 |
| 4342.068 | 60 | 40 | MIT | 23024.05 | a ³ F ₂ - z ³ D ₂ ^o | 1.089 | 1.035 |
| 4341.042 | 7 | - | MIT | 23029.49 | a ³ D ₁ - y ³ P ₂ ^o | | |
| 4340.343 | 10 | - | MIT | 23033.20 | a ³ H ₅ - z ³ H ₄ ^o | (1.041) | 0.895p |
| 4338.678 | 7 | - | MIT | 23042.04 | 42 - 204 | (1.343) | 0.938p |
| 4337.266 | 15 | - | MIT | 23049.55 | a ³ F ₄ - z ⁷ F ₄ ^o | 1.283 | 1.366 |
| 4336.424 | 12 | - | MIT | 23054.02 | a ⁵ D ₄ - z ⁵ G ₃ ^o | | |
| 4335.124 | 2 | - | MF | 23060.93 | a ³ D ₁ - y ⁵ P ₁ ^o | | |
| 4332.678 | 3 | - | MF | 23073.95 | b ³ F ₃ - y ⁵ D ₂ ^o | | |
| 4331.165 | 15 | - | MIT | 23082.01 | a ⁵ P ₃ - z ³ G ₃ ^o | | |
| 4328.558 | 6 | - | MIT | 23095.95 | a ³ P ₁ - z ⁵ P ₂ ^o | | |
| 4327.429 | 7 | - | MIT | 23101.94 | a ³ F ₃ - z ⁵ S ₂ ^o | 1.194 | 2.029 |
| | | | | or | z ⁷ D ₁ ^o - 61 | | |
| 4326.825 | 20 | - | MIT | 23105.16 | a ³ P ₂ - y ⁵ D ₂ ^o | 1.529 | 1.473 |
| 4325.052 | 25 | 10 | MIT | 23114.63 | b ³ P ₂ - x ⁵ D ₃ ^o | 1.320 | 1.428 |
| | | | | or | a ⁵ D ₁ - z ⁵ D ₂ ^o | | |
| 4324.190 | 2 | - | MF | 23119.24 | z ⁷ D ₂ ^o - 59 | | |
| 4320.816 | 5 | - | MIT | 23137.29 | b ³ P ₁ - z ³ P ₂ ^o | | |
| 4320.580 | 5 | - | MIT | 23138.50 | a ³ H ₄ - y ³ G ₃ ^o | | |
| 4319.869 | 20 | 40 | MIT | 23142.37 | a ⁵ P ₂ - z ⁵ S ₂ ^o | 1.562 | 2.032 |
| 4319.125 | 6 | - | MIT | 23146.35 | a ³ D ₂ - x ⁵ D ₁ ^o | | |
| 4318.433 | 15 | - | MIT | 23150.06 | a ⁵ D ₂ - z ³ D ₂ ^o | 1.231 | 1.029 |
| 4316.638 | 12 | - | MIT | 23159.68 | a ³ F ₂ - z ⁷ P ₂ ^o | 1.084 | 2.055 |
| 4312.905 | 3 | - | MF | 23179.73 | a ³ H ₄ - z ¹ G ₄ ^o | | |
| 4312.477 | 6 | - | MIT | 23181.98 | a ³ D ₁ - y ³ P ₀ ^o | 0.71 | 0/0 n |
| 4308.406 | 3 | - | MF | 23203.84 | a ³ D ₁ - y ³ P ₁ ^o | | |
| 4307.595 | 20 | 50 | MIT | 23208.31 | a ³ F ₂ - z ³ F ₃ ^o | | |
| 4301.147 | 5 | - | MIT | 23243.10 | a ³ D ₃ - y ³ F ₃ ^o | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman g_1 | Effect g_2 |
|-----------|-----|-----|-------|----------|---|-----------------|-----------------|
| 4297.711 | 60 | 50 | MIT | 23261.71 | $a^3F_3 - z^5G_4^0$ | 1.19 | 1.11 |
| 4296.689 | 7 | - | MIT | 23267.21 | $a^1P_1 - v^3D_2^0$ | | |
| 4295.928 | 20 | 20 | MIT | 23271.33 | $b^3F_4 - z^3F_3^0$ | 1.26 | 1.13 |
| 4294.791 | 20 | - | MIT | 23277.49 | $a^5D_3 - z^3G_3^0$ | 1.421 | 0.871 |
| 4293.284 | 15 | - | MIT | 23285.66 | $a^5D_2 - z^7P_2^0$ | 1.235 | 2.061 |
| 4290.529 | 6 | - | MIT | 23300.62 | $a^3F_3 - z^7P_3^0$ | | |
| 4287.046 | 15 | - | MIT | 23319.55 | $b^3P_2 - y^3D_2^0$ | 1.313 | 1.172 |
| 4284.331 | 25 | 20 | MIT | 23334.32 | $a^5D_2 - z^3F_3^0$ | 1.227 | 1.127 |
| 4283.123 | 2 | - | MF | 23340.90 | $a^5P_2 - z^7P_3^0$ | | |
| 4282.208 | 3 | - | MF | 23345.89 | $a^3F_4 - z^3G_4^0$ | | |
| 4281.930 | 7 | - | MIT | 23347.41 | $a^3H_6 - z^3H_6^0$ | 1.164 | 1.174 up |
| 4278.689 | 7 | - | MIT | 23365.09 | $b^3P_1 - z^3P_1^0$ | | |
| 4278.262 | 3 | - | MF | 23367.43 | 42 - 208 ⁰ | | |
| 4277.255 | 7 | - | MIT | 23372.92 | $b^3P_0 - x^5D_1^0$ or $a^5F_3 - z^7D_4^0$ | 0/0 | 1.570 n |
| 4274.647 | 2 | - | MF | 23387.18 | $a^1D_2 - y^3F_2^0$ | | |
| 4269.053 | 2 | - | MF | 23417.83 | $b^3F_3 - z^5P_3^0$ | | |
| 4268.664 | tr | - | MF | 23419.97 | $a^3G_3 - z^3P_2^0$ | | |
| 4265.990 | 13 | - | MIT | 23434.64 | $b^3F_2 - z^5P_2^0$ | | |
| 4265.607 | 12 | - | MIT | 23436.75 | $a^5P_3 - z^3D_2^0$ | | |
| 4263.396 | 10 | - | MIT | 23448.90 | $a^3P_2 - z^5P_3^0$ | | |
| 4260.004 | 12 | - | MIT | 23467.57 | $a^3P_2 - y^5D_1^0$ | 1.54 | 1.54 |
| 4258.987 | 15 | - | MIT | 23473.17 | $b^3P_2 - z^3P_2^0$ | 1.316 | 1.470 |
| 4258.200 | 2 | - | MF | 23477.52 | $z^7D_3^0 - 56$ | | |
| 4255.708 | 6 | - | MIT | 23491.26 | $b^3P_1 - z^3P_0^0$ | | |
| 4252.725 | 2 | - | MF | 23507.74 | 42 - A208 | | |
| 4250.615 | 10 | - | MF | 23519.41 | $a^3H_4 - z^1H_5^0$ or $z^7D_3^0 - 57$ | | |
| 4250.362 | tr | - | MF | 23520.81 | $z^7D_3^0 - 58$ | | |
| 4248.143 | 12 | - | MIT | 23533.10 | $a^3D_2 - z^3S_1^0$ | 1.15 | 1.56 |
| 4246.334 | 15 | - | MIT | 23543.12 | $a^1G_4 - y^3F_4^0$ | 0.991 | 1.107 |
| 4244.832 | 25 | - | MIT | 23551.45 | $a^3D_3 - y^3P_2^0$ | | |
| 4243.061 | 150 | 40 | MIT | 23561.28 | $a^5D_4 - z^3D_3^0$ | 1.447 | 1.203 |
| 4241.053 | 100 | 20 | MIT | 23572.44 | $a^5P_3 - z^7P_2^0$ | 1.626 | 2.062 |
| 4236.674 | 20 | - | MIT | 23596.80 | $a^1G_4 - z^3H_5^0$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman g_1 | Effect g_2 |
|-----------|-----|-----|-------|----------|-------------------|-----------------|-----------------|
| 4236.199 | 3 | - | MF | 23599.44 | $b^3F_2 - z^5P_1$ | | |
| 4232.322 | 40 | - | MIT | 23621.07 | $a^5P_3 - z^3F_3$ | 1.621 | 1.127 |
| 4230.312 | 60 | - | MIT | 23632.29 | $a^5D_3 - z^3D_2$ | 1.422 | 1.034 |
| 4229.309 | 40 | - | MIT | 23637.89 | $b^3P_1 - y^3D_1$ | 1.440 | 0.752 |
| 4225.092 | 25 | - | MIT | 23661.48 | $a^1P_1 - z^1D_2$ | 0.95 | 1.03 |
| 4223.348 | 3 | - | MF | 23671.25 | $a^3H_4 - x^3D_3$ | | |
| 4222.690 | 3 | - | MF | 23674.94 | $a^5F_1 - z^7D_1$ | | |
| 4220.675 | 60 | - | MIT | 23686.24 | $b^3P_1 - x^5D_2$ | 1.443 | 1.443n |
| 4218.054 | 3 | - | MF | 23700.96 | $b^3F_2 - z^3P_1$ | | |
| 4217.268 | 100 | - | MIT | 23705.38 | $a^3F_4 - z^7P_4$ | 1.285 | 1.658 |
| 4214.557 | 7 | - | MIT | 23720.63 | $a^3D_1 - y^3F_2$ | | |
| 4214.442 | 100 | 40 | MIT | 23721.27 | $b^3P_2 - y^3D_3$ | | |
| 4212.063 | 125 | 80 | MIT | 23734.67 | $a^3F_4 - z^5G_5$ | | |
| 4207.636 | 20 | - | MIT | 23759.65 | $b^3P_0 - z^3S_1$ | 0/0 | 1.570n |
| 4206.170 | 7 | - | MF | 23767.93 | $a^5D_3 - z^7P_2$ | | |
| 4206.016 | 100 | 40 | MIT | 23768.79 | $a^3F_3 - z^3G_3$ | 1.196 | 0.870 |
| 4199.902 | 150 | 300 | MIT | 23803.40 | $a^3F_4 - z^3F_4$ | | |
| 4198.875 | 60 | 100 | MIT | 23809.22 | $a^5P_2 - z^3G_3$ | 1.559 | 0.865 |
| 4197.579 | 100 | 100 | MIT | 23816.57 | $a^5D_3 - z^3F_3$ | 1.417 | 1.128 |
| 4196.871 | 60 | 50 | MIT | 23820.58 | $b^3P_1 - x^5D_0$ | 1.443 | 0/0 n |
| 4192.628 | 2 | - | MF | 23844.94 | $a^3H_4 - A181$ | | |
| 4189.462 | 15 | 9 | MIT | 23862.71 | $a^5D_4 - z^5G_4$ | | |
| 4188.730 | 2 | - | MF | 23866.88 | 42 - A210 | | |
| 4182.831 | 12 | 8 | MIT | 23900.54 | $a^3H_6 - y^3G_5$ | | |
| 4182.644 | 15 | 12 | MIT | 23901.61 | $a^5D_4 - z^7P_3$ | 1.448 | 1.895 |
| 4182.457 | 20 | 30 | MIT | 23902.68 | $a^1D_2 - z^1F_3$ | (1.175) | 1.137n |
| 4175.433 | 7 | 10 | MIT | 23942.89 | $a^1H_5 - y^5G_6$ | (1.007) | 1.219p |
| 4175.301 | 5 | - | MF | 23943.64 | $a^3G_4 - x^5D_3$ | | |
| 4173.396 | 12 | - | MF | 23954.57 | $a^3D_2 - y^5P_2$ | | |
| 4172.457 | 3 | - | MF | 23959.96 | $a^5P_1 - z^3D_1$ | | |
| 4170.900 | 3 | - | MF | 23968.91 | $a^3G_3 - x^5D_2$ | | |
| 4170.592 | 10 | - | MIT | 23970.68 | $a^1D_2 - x^3D_1$ | | |
| 4170.051 | 20 | 25 | MIT | 23973.79 | $b^3P_2 - y^3D_1$ | 1.316 | 0.756 |
| 4167.512 | 100 | 150 | MIT | 23988.39 | $a^3F_2 - z^3F_2$ | 1.085 | 1.023 |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman g_1 | Effect g_2 |
|-----------|-----|-----|-------|----------|---------------------|-----------------|-----------------|
| 4166.876 | 20 | 25 | MIT | 23992.06 | $a^3F_4 - z^5G_3^o$ | 1.287 | 0.947 |
| 4166.773 | tr | - | MF | 23992.65 | $a^1P_1 - x^3P_2^o$ | | |
| 4161.656 | 25 | 50 | MIT | 24022.15 | $b^3P_2 - x^5D_2^o$ | 1.317 | 1.442 |
| 4159.172 | 15 | 6 | MIT | 24036.49 | $a^3H_5 - z^1G_4^o$ | (1.041) | 1.035n |
| 4157.736 | 15 | 5 | MIT | 24044.79 | $a^3D_3 - y^3G_3^o$ | | |
| 4156.261 | 10 | 5wh | MIT | 24053.33 | $a^1H_5 - y^1H_5^o$ | (1.007) | 1.035p |
| 4155.249 | 12 | 6 | MIT | 24059.19 | $a^1P_1 - x^3P_1^o$ | | |
| 4153.879 | 10 | - | MF | 24067.12 | $a^5F_2 - z^7D_1^o$ | | |
| 4150.623 | 6 | - | MF | 24086.00 | $a^3D_3 - z^1G_4^o$ | | |
| 4150.299 | 20 | 9 | MIT | 24087.88 | $a^5D_0 - z^3D_1^o$ | 0/0 | 0.518n |
| 4148.375 | 60 | 15 | MIT | 24099.05 | $a^5D_1 - z^3F_2^o$ | 1.808 | 1.031 |
| 4146.771 | 100 | 70 | MIT | 24108.37 | $a^5P_1 - z^5D_2^o$ | 1.991 | 1.483 |
| 4145.738 | 125 | 150 | MIT | 24114.38 | $a^5D_2 - z^3F_2^o$ | 1.233 | 1.024 |
| 4144.164 | 150 | 200 | MIT | 24123.54 | $a^3F_3 - z^3D_2^o$ | 1.199 | 1.037 |
| 4141.874 | 3 | - | MF | 24136.88 | $a^1D_2 - w^3F_2^o$ | | |
| 4137.234 | 25 | 15 | MIT | 24163.94 | $a^5P_2 - z^3D_2^o$ | 1.559 | 1.032 |
| 4134.85 | 12 | 5 | MIT | 24177.88 | $a^3P_1 - y^5F_2^o$ | (1.684) | 1.066p |
| 4131.225 | 10 | - | MIT | 24199.09 | $a^3H_5 - y^3G_4^o$ | | |
| 4128.682 | 4 | - | MF | 24214.00 | $a^1D_2 - w^3F_3^o$ | | |
| 4127.868 | 25 | 35 | MIT | 24218.77 | $b^3P_1 - x^5D_1^o$ | 1.445 | 1.570 |
| 4127.440 | 20 | 30 | MIT | 24221.28 | $a^5F_3 - z^5D_4^o$ | 1.24 | 1.48 |
| 4127.412 | 12 | 1 | MIT | 24227.32 | $b^3F_3 - z^5P_2^o$ | | |
| 4123.813 | 20 | 10 | MIT | 24242.43 | $a^3D_3 - y^3F_2^o$ | 1.320 | 0.878 |
| 4123.064 | 25 | 35 | MIT | 24246.99 | $a^3F_2 - y^5D_3^o$ | 1.086 | 1.494 |
| 4122.787 | 6 | - | MIT | 24248.62 | $a^3D_3 - y^3G_4^o$ | | |
| 4121.691 | 2 | - | MF | 24255.07 | $a^1D_2 - 186$ | | |
| 4121.119 | 15 | - | MF | 24258.43 | $a^3P_2 - z^5P_2^o$ | | |
| 4120.987 | 25 | 30 | MIT | 24259.22 | $a^3F_3 - z^7P_2^o$ | 1.192 | 2.054 |
| 4118.498 | 40 | - | MIT | 24273.87 | $a^5F_4 - z^7D_4^o$ | | |
| 4114.134 | 20 | 5 | MIT | 24299.62 | $a^5P_2 - z^7P_2^o$ | | |
| 4113.383 | 40 | 50 | MIT | 24304.06 | $a^3D_1 - x^3D_1^o$ | 0.676 | 0.893 |
| 4112.741 | 125 | 200 | MIT | 24307.80 | $a^3F_3 - z^3F_3^o$ | 1.199 | 1.135 |
| 4109.646 | 20 | 6 | MIT | 24326.16 | $b^3F_4 - y^5D_4^o$ | | |
| 4108.060 | 10 | 7 | MIT | 24335.55 | $a^3G_5 - x^5D_4^o$ | (1.190) | 1.487p |
| 4107.837 | 25 | 20 | MIT | 24336.97 | $a^1G_4 - x^3F_4^o$ | 0.996 | 1.118 |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman g_1 | Effect g_2 |
|-----------|-----|-----|-------|----------|---------------------|-----------------|-----------------|
| 4105.912 | 12 | 2 | MIT | 24348.28 | $a^5P_2 - z^3F_3^0$ | | |
| 4102.285 | 15 | 10 | MIT | 24369.79 | $a^5D_4 - z^3G_3^0$ | | |
| 4101.745 | 20 | 60 | MIT | 24373.02 | $a^5D_2 - y^5D_3^0$ | 1.233 | 1.497 |
| 4101.232 | 7 | 2h | MIT | 24376.06 | $a^3H_5 - z^1H_5^0$ | | |
| 4100.643 | 4 | - | MF | 24379.56 | $a^3D_2 - y^3F_3^0$ | | |
| 4100.373 | 12 | 10 | MIT | 24381.16 | $a^5F_3 - z^7D_2^0$ | | |
| 4097.791 | 25 | 125 | MIT | 24396.53 | $a^3F_2 - z^3D_1^0$ | 1.092 | 0.527 |
| 4097.026 | 15 | 15 | MIT | 24401.09 | $a^5P_3 - z^3F_2^0$ | 1.63 | 1.03 |
| 4091.062 | 20 | 20 | MIT | 24436.66 | $a^1D_2 - x^3F_3^0$ | 1.179 | 1.281 |
| 4088.360 | 10 | 1 | MIT | 24452.81 | $a^3P_1 - y^5F_1^0$ | | |
| 4085.429 | 40 | 50 | MIT | 24470.35 | $a^3D_1 - w^3F_2^0$ | 0.678 | 0.890 |
| | | | | and | $a^5P_1 - y^5D_1^0$ | 1.983 | 1.524 |
| 4082.794 | 15 | 10 | MIT | 24486.14 | $a^3P_0 - y^5F_1^0$ | 0/0 | 0.148n |
| 4080.600 | 125 | 300 | MIT | 24499.31 | $a^3F_4 - z^3D_3^0$ | 1.291 | 1.217 |
| 4079.277 | 12 | 5 | MIT | 24507.25 | $a^5D_1 - z^3D_1^0$ | 1.78 | 0.51 |
| 4077.738 | 4 | 50 | MF | 24516.50 | $b^3F_2 - y^5F_2^0$ | | |
| | | | | or | $z^7D_3^0 - 62$ | | |
| 4076.733 | 60 | 25 | MIT | 24522.55 | $a^5D_2 - z^3D_1^0$ | 1.235 | 0.523 |
| 4073.116 | 6 | 25 | MIT | 24544.32 | $a^3G_3 - y^3F_4^0$ | | |
| 4073.00 | 2 | - | S | 24545.00 | $a^3F_2 - y^5D_2^0$ | 1.089 | 1.478 |
| 4071.873 | 10 | 5 | MIT | 24551.81 | $a^1H_5 - x^5F_4^0$ | | |
| 4071.398 | 12 | 20 | MIT | 24554.68 | $b^3P_2 - x^5D_1^0$ | 1.314 | 1.570 |
| 4068.366 | 40 | 60 | MIT | 24572.98 | $a^1G_4 - z^3H_4^0$ | 0.991 | 0.892 |
| 4067.613 | 25 | 35 | MIT | 24577.53 | $a^3D_3 - x^3D_3^0$ | 1.333 | 1.163 |
| 4064.456 | 20 | 60 | MIT | 24596.61 | $a^5D_3 - z^3F_2^0$ | 1.422 | 1.027 |
| 4064.105 | 15 | 25 | MIT | 24598.80 | $a^5D_0 - y^5D_1^0$ | 0/0 | 1.527n |
| 4062.988 | 12 | 35 | MIT | 24605.50 | $b^3P_1 - z^3S_1^0$ | 1.445 | 1.570 |
| 4062.853 | 10 | 10 | MIT | 24606.32 | $a^1H_5 - w^3G_4^0$ | (1.007) | 0.926p |
| 4054.732 | 5 | - | MIT | 24655.60 | $a^5D_1 - y^5D_2^0$ | | |
| 4054.051 | 40 | 100 | MIT | 24659.74 | $a^5P_3 - y^5D_3^0$ | 1.625 | 1.497 |
| 4052.195 | 25 | 50 | MIT | 24671.05 | $a^5D_2 - y^5D_2^0$ | 1.227 | 1.470 |
| 4051.400 | 125 | 200 | MIT | 24675.88 | $a^5P_3 - y^5D_4^0$ | 1.61 | 1.48 |
| 4049.413 | 15 | 12 | MIT | 24687.99 | $a^3D_2 - y^3P_2^0$ | 1.167 | 1.299 |
| 4045.762 | 25 | 35 | MIT | 24710.27 | $a^1D_2 - w^3D_2^0$ | 1.178 | 1.178n |
| 4041.998 | 12 | 1 | MIT | 24733.28 | $a^1G_4 - y^3F_3^0$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman g_1 | Effect g_2 |
|-----------|-----|-----|-------|----------|---------------------|-----------------|-----------------|
| 4041.998 | 12 | 1 | MIT | 24733.28 | $a^1G_4 - y^3F_3^o$ | | |
| 4039.210 | 25 | 50 | MIT | 24750.35 | $a^1G_4 - y^3G_5^o$ | 0.996 | 1.141 |
| 4037.737 | 12 | 5 | MIT | 24759.38 | $a^5P_1 - y^5D_0^o$ | 1.982 | 0/0 n |
| 4036.492 | 10 | 3 | MIT | 24767.01 | $a^1H_5 - 211$ | | |
| 4033.713 | 4 | - | MF | 24784.08 | $a^3H_4 - x^3D_3^o$ | | |
| 4032.521 | 10 | 5 | MIT | 24791.40 | $b^3F_2 - y^5F_1^o$ | | |
| 4032.205 | 20 | 20 | MIT | 24793.34 | $a^5F_2 - z^5D_3^o$ | 0.999 | 1.425 |
| 4030.997 | 15 | 12 | MIT | 24800.78 | $a^3F_4 - z^5G_4^o$ | | |
| 4028.435 | 10 | 2 | MIT | 24816.98 | $b^3F_3 - y^5F_4^o$ | (1.086) | 1.358p |
| 4025.468 | 6 | - | MF | 24834.84 | $a^1D_2 - w^3D_3^o$ | | |
| 4024.695 | 12 | 5 | MIT | 24839.61 | $a^3F_4 - z^7P_3^o$ | | |
| 4023.833 | 25 | 60 | MIT | 24844.93 | $a^5F_4 - z^7D_3^o$ | 1.347 | 1.737 |
| | | | | | or $x^5D_3^o - 63$ | | |
| 4022.161 | 40 | 100 | MIT | 24855.25 | $a^5D_3 - y^5D_3^o$ | 1.421 | 1.488 |
| 4020.995 | 15 | 12 | MIT | 24862.46 | $a^3D_2 - y^3P_1^o$ | 1.160 | 1.609 |
| 4019.553 | 12 | 8 | MIT | 24871.38 | $a^5D_3 - y^5D_4^o$ | | |
| 4016.753 | 7 | - | MIT | 24888.72 | $a^3F_2 - z^5P_3^o$ | | |
| 4013.738 | 10 | 5 | MIT | 24907.42 | $a^3F_2 - y^5D_1^o$ | | |
| 4013.505 | 15 | 12 | MIT | 24908.86 | $a^5D_4 - z^3F_3^o$ | 1.458 | 1.141 |
| 4008.269 | 20 | 20 | MIT | 24941.41 | $b^3P_2 - z^3S_1^o$ | 1.308 | 1.566 |
| 4007.535 | 20 | 10 | MIT | 24945.97 | $b^3P_0 - y^5P_1^o$ | 0/0 | 2.312 |
| 4006.598 | 25 | 15 | MIT | 24951.80 | $b^3F_4 - z^5P_3^o$ | | |
| 4005.640 | 25 | 30 | MIT | 24957.77 | $a^5P_3 - y^5D_2^o$ | 1.626 | 1.481 |
| 4005.086 | 6 | - | MF | 24961.22 | $a^1D_2 - x^3D_2^o$ | (1.175) | 1.004p |
| 4000.534 | 6 | - | MF | 24989.62 | 42 - $u^3D_2^o$ | | |
| 4000.131 | 5 | - | MF | 24992.14 | $a^3D_3 - w^3F_2^o$ | | |
| 3996.509 | 10 | 4 | MIT | 25014.80 | $a^5D_2 - z^5P_3^o$ | 1.24 | 1.65 |
| 3995.977 | 30 | 30 | MIT | 25018.12 | $a^5D_1 - y^5D_1^o$ | 1.793 | 1.523 |
| 3994.560 | 5 | - | MIT | 25027.00 | $b^3P_1 - y^5P_2^o$ | | |
| 3993.531 | 10 | 5 | MIT | 25033.84 | $a^5D_2 - y^5D_1^o$ | 1.230 | 1.519 |
| 3987.795 | 3 | 50 | S | 25069.39 | $a^3D_3 - w^3F_3^o$ | 1.330 | 1.238 |
| 3984.858 | 60 | 70 | MIT | 25087.93 | $a^3F_3 - z^3F_2^o$ | 1.198 | 1.025 |
| 3984.682 | 4 | 2 | MIT | 25089.04 | $b^3P_0 - y^3P_1^o$ | | |
| 3979.424 | 60 | 60 | MIT | 25122.18 | $a^5F_4 - z^5D_4^o$ | 1.347 | 1.485 |
| 3978.445 | 60 | 70 | MIT | 25128.37 | $a^5P_2 - z^3F_2^o$ | 1.569 | 1.028 |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman Effect | |
|-----------|-----|-----|-------|----------|---------------------|---------------|---------|
| | | | | | | g_1 | g_2 |
| 3974.501 | 20 | 8 | MIT | 25153.30 | $a^5D_3 - y^5D_2^o$ | (1.420) | 1.470 |
| 3970.385 | 3 | - | MIT | 25179.38 | $a^3P_1 - y^3D_2^o$ | | |
| 3970.080 | 2 | - | MF | 25181.31 | $a^3D_2 - y^3G_3^o$ | | |
| 3969.794 | 8 | 4 | MIT | 25183.12 | $a^3P_2 - y^5F_3^o$ | 1.52 | 1.26 |
| 3964.896 | 50 | 40 | MIT | 25214.23 | $a^5F_5 - z^7D_5^o$ | 1.397 | 1.594 |
| 3958.084 | 2 | - | MF | 25257.63 | 42 - $w^5D_1^o$ | | |
| 3957.449 | 8 | 5 | MIT | 25261.68 | $a^5P_1 - z^5P_2^o$ | 1.985 | 1.808 |
| 3952.678 | 20 | 30 | MIT | 25292.17 | $a^3D_3 - x^3F_3^o$ | 1.33 | 1.28 |
| 3952.290 | 4 | 1 | MIT | 25294.65 | $a^3D_1 - x^3D_2^o$ | (0.676) | 1.006 |
| 3951.207 | 10 | 6 | MIT | 25301.59 | $a^5P_3 - z^5P_3^o$ | 1.62 | 1.64 up |
| 3950.412 | 10 | 10 | MIT | 25306.68 | $a^5D_1 - y^5D_0^o$ | 1.796 | 0/0 n |
| 3950.214 | 12 | 15 | MIT | 25307.95 | $a^3F_4 - z^3G_3^o$ | 1.280 | 0.866 |
| 3950.004 | 10 | 8 | MIT | 25309.29 | $a^1H_5 - A214$ | (1.007) | 0.962n |
| 3949.417 | 10 | 5 | MIT | 25313.06 | $b^3F_2 - x^5D_3^o$ | 0.74 | 1.41 |
| 3946.314 | 8 | 3 | MIT | 25332.96 | $a^3P_1 - z^3P_2^o$ | 1.691 | 1.475 |
| 3945.572 | 50 | 100 | MIT | 25337.72 | $a^3G_3 - x^3F_4^o$ | 0.753 | 1.112 |
| | | | | or | $a^3H_5 - z^3I_6^o$ | | |
| 3944.190 | 10 | 4 | MIT | 25346.60 | $a^3F_3 - y^5D_3^o$ | | |
| 3942.063 | 12 | 9 | MIT | 25360.27 | $a^5F_1 - z^5D_2^o$ | 0.004 | 1.324 |
| 3941.654 | 12 | 8 | MIT | 25362.91 | $b^3P_2 - y^5P_2^o$ | (1.315) | 1.711p |
| 3940.563 | 4 | - | MIT | 25369.93 | $a^1D_2 - z^1P_1^o$ | | |
| 3939.100 | 5 | - | MIT | 25379.35 | $a^3D_2 - y^3F_2^o$ | | |
| 3937.903 | 20 | 15 | MIT | 25387.07 | $a^5P_2 - y^5D_3^o$ | 1.53 | 1.48 |
| 3933.546 | 20 | - | MF | 25415.18 | $a^5F_3 - z^5D_3^o$ | 1.247 | 1.427 |
| 3931.759 | 50 | 70 | MIT | 25426.74 | $a^3G_4 - y^3F_4^o$ | 1.032 | 1.105 |
| | | | | and | $a^5P_1 - z^5P_1^o$ | 1.981 | 2.384 |
| 3925.925 | 60 | 100 | MIT | 25464.52 | $a^5F_5 - z^7D_4^o$ | 1.397 | 1.625 |
| 3924.633 | 6 | 5 | MIT | 25472.90 | $a^1H_5 - 216$ | | |
| 3923.467 | 60 | 100 | MIT | 25480.47 | $a^3G_4 - z^3H_5^o$ | (1.033) | 1.047 |
| 3922.335 | 4 | - | MIT | 25487.83 | $a^1D_2 - x^3F_2^o$ | | |
| 3920.915 | 20 | 20 | MIT | 25497.06 | $a^5D_3 - z^5P_3^o$ | 1.423 | 1.650 |
| 3920.567 | 4 | - | MIT | 25499.31 | $a^3H_5 - x^3G_5^o$ | | |
| 3917.710 | 3 | - | MIT | 25517.92 | $b^3F_2 - y^3D_2^o$ | | |
| 3914.853 | 20 | 15 | MIT | 25536.54 | $a^5P_2 - z^3D_1^o$ | 1.563 | 0.518 |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman g_1 | Effect g_2 |
|-----------|-----|-----|-------|----------|---------------------|-----------------|-----------------|
| 3913.013 | 3 | - | MIT | 25548.58 | $a^1P_1 - w^5D_2^o$ | | |
| 3912.112 | 10 | 8 | MIT | 25554.43 | $a^5D_0 - z^5P_1^o$ | 0/0 | 2.384n |
| 3911.144 | 6 | 2 | MIT | 25560.76 | $a^3P_1 - z^3P_1^o$ | 1.683 | 1.312 |
| 3909.075 | 30 | 50 | MIT | 25574.28 | $a^3G_3 - z^3H_4^o$ | 0.764 | 0.898 |
| 3908.765 | 12 | 12 | MIT | 25576.31 | $a^1G_4 - z^1G_4^o$ | 0.988 | 1.032 |
| 3905.991 | 6 | 3h | MIT | 25594.42 | 42 - 227 | (1.343) | 1.061p |
| 3902.816 | 5 | - | MIT | 25615.29 | $a^3P_2 - y^5F_1^o$ | | |
| 3901.245 | 50 | 12 | MIT | 25625.61 | $a^5F_4 - z^5F_5^o$ | | |
| 3898.361 | 12 | 6 | MIT | 25644.57 | $a^3F_3 - y^5D_2^o$ | 1.197 | 1.478 |
| 3897.236 | 12 | 6 | MIT | 25651.97 | $b^3F_4 - y^5F_5^o$ | 1.259 | 1.400 |
| 3894.245 | 8 | 2 | MIT | 25671.61 | $b^3F_2 - z^3P_2^o$ | | |
| 3892.773 | 10 | 4 | MIT | 25681.38 | $a^1P_1 - u^3D_2^o$ | 0.928 | 1.086 |
| 3892.209 | 50 | 40 | MIT | 25685.10 | $a^5P_2 - y^5D_2^o$ | 1.559 | 1.478 |
| 3891.410 | 20 | 3 | MIT | 25690.37 | $a^3D_3 - w^3D_3^o$ | 1.334 | 1.168 |
| 3890.197 | 30 | 8 | MIT | 25698.38 | $a^3F_2 - z^5P_2^o$ | 1.090 | 1.808 |
| 3889.424 | 2 | - | MF | 25703.42 | $a^3D_1 - z^1P_1^o$ | | |
| 3887.772 | 15 | 8 | MIT | 25714.41 | $a^3D_2 - x^3D_3^o$ | 1.159 | 1.159n |
| 3884.676 | 20 | 6 | MIT | 25734.90 | $a^3G_3 - y^3F_3^o$ | 0.754 | 0.967 |
| 3884.016 | 20 | 6 | MIT | 25739.28 | $a^1G_4 - y^3G_4^o$ | 0.993 | 1.195 |
| 3882.006 | 12 | - | MIT | 25752.61 | $a^5F_2 - z^5D_2^o$ | 1.000 | 1.327 |
| 3880.806 | 5 | - | MIT | 25760.57 | $b^3P_1 - y^3P_2^o$ | 1.42 | 1.29 |
| 3876.648 | 12 | 1 | MIT | 25788.20 | $b^3P_2 - y^5P_1^o$ | 1.313 | 0.966 |
| 3876.082 | 20 | 3 | MIT | 25791.96 | $b^3P_1 - y^5P_1^o$ | 1.436 | 2.315 |
| 3873.525 | 30 | 45 | MIT | 25808.99 | $a^5D_1 - z^5P_2^o$ | 1.81 | 1.81 n |
| 3872.718 | 4 | 6 | MIT | 25814.37 | $a^1P_1 - u^3D_1^o$ | | |
| 3872.372 | 4 | 8 | MIT | 25816.67 | $a^3D_3 - x^3D_2^o$ | | |
| 3871.215 | 10 | 1h | MIT | 25824.39 | $a^5D_2 - z^5P_2^o$ | 1.230 | 1.800 |
| 3869.836 | 3 | - | MF | 25833.59 | $a^3P_1 - y^3D_1^o$ | | |
| 3867.839 | 60 | 35 | MIT | 25846.93 | $a^3F_4 - z^3F_3^o$ | 1.286 | 1.136 |
| 3865.743 | 4 | 4 | MIT | 25860.94 | $a^1P_1 - w^5D_0^o$ | | |
| 3865.408 | 10 | 4 | MIT | 25863.22 | $a^3F_2 - z^5P_1^o$ | 1.090 | 2.388 |
| 3864.857 | 5 | - | MIT | 25866.87 | $a^3P_0 - y^3D_1^o$ | 0/0 | 0.78 n |
| 3862.646 | 2 | 60 | MIT | 25881.68 | $a^3H_4 - z^3I_5^o$ | (0.834) | 0.853n |
| | | | | and | $a^3P_1 - x^5D_2^o$ | | |
| 3861.704 | 2 | 5 | MIT | 25887.99 | $b^3F_3 - x^5D_4^o$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman g_1 | Effect g_2 |
|-----------|-----|-----|-------|----------|----------------------|-----------------|-----------------|
| 3861.426 | 5 | - | MIT | 25889.85 | $a^3G_4 - y^5P_3^0$ | | |
| 3860.723 | 20 | 4 | MIT | 25894.57 | $a^3D_2 - z^1F_3^0$ | | |
| 3859.712 | 6 | 15 | MIT | 25901.35 | $a^3H_4 - y^1F_3^0$ | 0.830 | 0.990 |
| 3858.686 | 4 | 4 | MIT | 25908.24 | $a^3D_1 - z^1S_0^0$ | 0.681 | 0/0 n |
| 3857.997 | 5 | 1 | MF | 25912.87 | $b^3P_1 - y^3P_0^0$ | | |
| 3857.551 | 50 | 25 | MIT | 25915.86 | $a^1G_4 - z^1H_5^0$ | (0.992) | 1.012n |
| 3856.981 | 5 | 5h | MIT | 25919.69 | $b^3F_2 - y^3D_3^0$ | | |
| 3856.459 | 50 | 8 | MIT | 25923.20 | $a^5F_3 - z^5F_4^0$ | 1.251 | 1.363 |
| 3854.727 | 10 | 5wh | MIT | 25934.85 | $b^3P_1 - y^3P_1^0$ | 1.449 | 1.611 |
| 3852.837 | 5 | 3h | MIT | 25947.57 | $a^5D_4 - y^5D_5^0$ | | |
| 3852.564 | 4 | 5h | MIT | 25949.41 | $a^1P_1 - w^5D_1^0$ | | |
| 3852.137 | 12 | 10 | MIT | 25952.29 | $a^1D_2 - y^1F_3^0$ | 1.173 | 0.997 |
| 3850.622 | 3 | - | MF | 25962.49 | $a^3D_2 - x^3D_1^0$ | | |
| 3850.432 | 50 | 10 | MIT | 25963.78 | $a^5D_4 - y^5D_4^0$ | 1.45 | 1.45 n |
| 3848.945 | 8 | 12 | MIT | 25973.80 | $a^5D_1 - z^5P_1^0$ | | |
| 3846.805 | 5 | - | MIT | 25988.26 | $a^3F_3 - z^5P_3^0$ | 1.197 | 1.646 |
| 3846.676 | 12 | 10 | MIT | 25989.13 | $a^5D_2 - z^5P_1^0$ | 1.229 | 2.383 |
| 3845.001 | tr | 10 | MF | 26000.40 | $a^1H_5 - u^3D_1^0$ | | |
| 3843.397 | 3 | - | MF | 26011.30 | $a^1H_5 - 222$ | | |
| 3843.159 | 10 | 5 | MIT | 26012.91 | $a^5F_1 - z^5D_1^0$ | 0.000 | 0.944 |
| 3842.661 | 6 | 3h | MIT | 26016.28 | $a^3P_1 - x^5D_0^0$ | 1.688 | 0/0 n |
| 3840.985 | 8 | 6 | MIT | 26027.63 | $a^3H_6 - z^3I_6^0$ | 1.164 | 1.013 |
| 3840.76 | 4 | 6 | MIT | 26029.13 | $a^5P_2 - z^5P_3^0$ | 1.57 | 1.65 |
| 3839.695 | 50 | 30 | MIT | 26036.40 | $a^3G_5 - y^3F_4^0$ | 1.190 | 1.112 |
| 3838.728 | 10 | 10 | MIT | 26042.94 | $a^3G_3 - y^3P_2^0$ | 0.74 | 1.28 |
| 3838.067 | 12 | 5wh | MIT | 26047.42 | $a^5P_2 - y^5D_1^0$ | (1.563) | 1.526n |
| 3835.990 | 6 | 1h | MIT | 26061.52 | $a^1D_2 - y^3S_1^0$ | 1.186 | 1.540 |
| 3835.048 | 50 | 6 | MIT | 26067.92 | $a^1G_4 - x^3D_3^0$ | 0.990 | 1.156 |
| 3831.795 | 60 | 50 | MIT | 26090.05 | $a^3G_5 - z^3H_5^0$ | 1.187 | 1.045 |
| 3830.877 | 10 | 4 | MIT | 26096.31 | $b^3P_2 - y^3P_2^0$ | 1.31 | 1.31 n |
| 3829.479 | 4 | 5 | MIT | 26105.83 | $b^3F_3 - x^5D_3^0$ | | |
| 3829.332 | 8 | 3 | MIT | 26106.84 | $a^3H_5 - w^3F_4^0?$ | | |
| 3828.714 | 30 | 8 | MIT | 26111.04 | $a^5P_3 - z^5P_2^0$ | 1.625 | 1.807 |
| 3826.267 | 2 | 2h | MF | 26127.75 | $b^3P_2 - y^5P_1^0$ | | |
| 3826.105 | 8 | 3 | MIT | 26128.85 | $a^3D_2 - w^3F_2^0$ | 1.156 | 0.884 |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman g_1 | Effect g_2 |
|-----------|-----|-----|-------|----------|--|-----------------|-----------------|
| 3824.932 | 30 | 25 | MIT | 26136.87 | $a^3P_2 - x^5D_3^o$ | 1.527 | 1.419 |
| 3822.091 | 50 | 25 | MIT | 26156.29 | $a^3D_3 - w^3F_4^o$ | 1.338 | 1.247 |
| 3819.767 | 12 | 6 | MIT | 26172.22 | $b^3F_2 - y^3D_1^o$ | 0.76 | 0.76 n |
| 3819.033 | 50 | 30 | MIT | 26177.24 | $a^5F_2 - z^5F_3^o$ | 0.997 | 1.295 |
| 3818.352 | 5 | 2 | MIT | 26181.91 | $a^3D_1 - w^3D_1^o$ | | |
| 3817.269 | 50 | 60 | MIT | 26189.33 | $a^3H_6 - x^3G_5^o$ | (1.164) | 1.189n |
| 3814.857 | 20 | 35 | MIT | 26205.89 | $a^3D_2 - w^3F_3^o$ | 1.14 | 1.21 |
| 3813.177 | 4 | 3 | MIT | 26217.44 | $a^3H_5 - 225?$ | | |
| 3812.718 | 12 | - | MIT | 26220.59 | $a^3G_4 - x^3F_4^o$ or $b^3F_2 - x^5D_2^o$ | 1.032 | 1.112 |
| 3809.639 | 2 | 10 | MF | 26241.78 | $a^1G_4 - A181$ | | |
| 3808.684 | 50 | 30 | MIT | 26248.36 | $a^1G_4 - z^1F_3^o$ | 0.990 | 1.128 |
| 3805.434 | 10 | 5 | MIT | 26270.98 | $b^3P_2 - y^3P_1^o$ | 1.313 | 1.602 |
| 3803.197 | 10 | 8 | MIT | 26286.23 | $a^1P_1 - 227$ | 0.923 | 1.053 |
| 3800.261 | 12 | 40 | MIT | 26306.54 | $a^5D_3 - z^5P_2^o$ | 1.41 | 1.80 |
| 3799.657 | 3 | 5 | MF | 26310.72 | $b^3F_3 - y^3D_2^o$ | | |
| 3799.347 | 70 | 100 | MIT | 26312.87 | $a^5F_5 - z^5D_4^o$ | 1.394 | 1.479 |
| 3798.901 | 70 | 100 | MIT | 26315.96 | $a^5F_4 - z^5D_3^o$ | 1.347 | 1.427 |
| 3798.052 | 30 | 40 | MIT | 26321.84 | $a^5F_1 - z^5F_2^o$ | 0.000 | 1.170 |
| 3795.175 | 12 | 6 | MIT | 26341.79 | $a^3P_2 - y^3D_2^o$ | 1.538 | 1.175 |
| 3794.924 | 20 | 30 | MIT | 26343.54 | $a^5P_1 - y^5F_2^o$ and $a^3D_3 - x^3F_2^o$ | 1.991 | 1.071 |
| 3793.905 | 3 | - | MF | 26350.61 | $b^3F_4 - y^5F_4^o$ | | |
| 3790.513 | 70 | 150 | MIT | 26374.19 | $a^5F_3 - z^5D_2^o$ | 1.248 | 1.317 |
| 3787.529 | 2 | - | MF | 26394.97 | $a^3D_1 - y^3S_1^o$ | | |
| 3786.055 | 70 | 100 | MIT | 26405.25 | $a^5F_2 - z^5D_1^o$ | (1.000) | 0.956n |
| 3784.737 | 4 | - | MF | 26414.55 | $a^3P_1 - x^5D_1^o$ | | |
| 3781.181 | 50 | 40 | MIT | 26439.66 | $a^1H_5 - A226$ | 1.006 | 1.030up |
| 3779.964 | 10 | 4 | MIT | 26447.68 | $a^3P_0 - x^5D_1^o$ | 0/0 | 1.563n |
| 3779.431 | 4 | - | MF | 26451.52 | $b^3P_1 - y^3F_2^o$ | | |
| 3778.701 | 12 | 10 | MIT | 26456.63 | $a^3G_4 - z^3H_4^o$ | 1.029 | 0.892 |
| 3777.759 | 3 | 4 | MIT | 26463.23 | $a^1D_2 - v^3D_2^o$ | 1.16 | 1.16 n |
| 3777.586 | 60 | 50 | MIT | 26464.44 | $a^5F_1 - z^5D_0^o$ or $b^3F_3 - z^3P_2^o$ | 0.0 | 0/0 n |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman g_1 | Effect g_2 |
|-----------|-----|-----|-------|----------|----------------------|-----------------|-----------------|
| 3773.170 | 12 | 4 | MIT | 26495.41 | $a^3P_2 - z^3P_2^o$ | 1.540 | 1.476 |
| 3767.350 | 50 | 50 | MIT | 26536.54 | $a^3G_3 - y^3G_3^o$ | 0.756 | 0.885 |
| 3764.032 | 6 | 5 | MIT | 26559.35 | $a^1G_4 - w^3F_3^o$ | 0.995 | 1.237 |
| 3761.508 | 12 | 45 | MIT | 26577.56 | $a^3G_3 - z^1G_4^o$ | 0.758 | 1.036 |
| 3760.031 | 20 | 50 | MIT | 26588.00 | $a^5F_1 - z^5F_1^o$ | 0.000 | 0.567 |
| 3759.836 | 12 | 25 | MIT | 26589.38 | $a^5D_4 - z^5P_3^o$ | 1.440 | 1.640 |
| 3756.225 | 2 | 5h | MF | 26614.94 | $x^5F_5^o - 63$ | | |
| 3755.931 | 30 | 60 | MIT | 26617.02 | $a^3G_4 - y^3F_3^o$ | 1.02 | 0.96 |
| 3755.727 | 6 | 8 | MIT | 26618.47 | $a^5P_1 - y^5F_1^o$ | 1.979 | 0.145 |
| 3755.090 | 20 | 25 | MIT | 26623.19 | $a^3F_2 - y^5F_3^o$ | 1.085 | 1.272 |
| 3753.545 | 30 | 60 | MIT | 26633.94 | $a^3G_4 - y^3G_5^o$ | 1.038 | 1.145 |
| 3752.778 | 8 | 3 | MIT | 26639.38 | $a^1H_5 - w^3F_4^o$ | | |
| 3751.853 | 5 | 3 | MIT | 26645.95 | $a^3H_4 - y^5G_5^o$ | | |
| 3746.218 | 4 | 4 | MIT | 26686.03 | $b^3F_4 - y^5F_3^o$ | 1.28 | 1.28 n |
| 3744.219 | 8 | 25 | MIT | 26700.28 | $a^5P_3 - y^5F_4^o$ | 1.627 | 1.359 |
| 3743.945 | 5 | 4 | MIT | 26702.23 | $a^3D_2 - w^3D_2^o$ | | |
| 3742.784 | 50 | 50 | MIT | 26710.51 | $a^3H_6 - z^3I_7^o$ | (1.164) | 1.146n |
| 3742.280 | 70 | 100 | MIT | 26714.11 | $a^5F_2 - z^5F_2^o$ | 0.998 | 1.158 |
| 3739.465 | 20 | 18 | MIT | 26734.22 | $a^3G_3 - y^3F_2^o$ | 0.750 | 0.888 |
| 3738.912 | 10 | 10 | MIT | 26738.17 | $a^3H_5 - z^3I_5^o$ | 1.029 | 0.852 |
| 3738.629 | 8 | 8 | MIT | 26740.37 | $a^3G_3 - y^3G_4^o$ | 0.760 | 1.195 |
| 3737.741 | 6 | 5 | MIT | 26746.43 | $a^5D_0 - y^5F_1^o$ | 0/0 | 0.149 |
| 3737.401 | 12 | 12 | MIT | 26748.98 | $a^5D_2 - y^5F_3^o$ | | |
| 3736.798 | 3 | - | MIT | 26753.30 | $b^3F_2 - x^5D_1^o$ | | |
| 3735.021 | 4 | - | MIT | 26766.03 | $a^3H_4 - y^5G_4^o$ | (0.834) | |
| 3733.049 | 10 | 3 | MIT | 26780.17 | $a^3F_2 - y^5F_2^o$ | 1.085 | 1.065up |
| 3732.765 | 4 | - | MIT | 26782.21 | $a^1G_4 - x^3F_3^o$ | | |
| 3732.029 | 6 | 8 | MIT | 26787.49 | $b^3P_2 - y^3F_2^o$ | 1.315 | 0.895 |
| 3730.904 | 3 | 5 | MIT | 26795.56 | $a^1D_2 - v^3D_1^o$ | | |
| 3730.592 | 2 | 5 | MIT | 26797.80 | $a^3F_3 - z^5P_2^o$ | 1.187 | 1.803 |
| 3730.433 | 12 | 70 | MIT | 26798.95 | $a^5F_3 - z^5F_3^o$ | 1.247 | 1.291up |
| 3730.132 | 3 | 1 | MF | 26801.11 | $a^3P_1 - z^3S_0^o?$ | | |
| 3728.030 | 100 | 150 | MIT | 26816.22 | $a^5F_5 - z^5F_5^o$ | 1.391 | 1.391n |
| 3726.926 | 100 | 150 | MIT | 26824.16 | $a^5F_4 - z^5F_4^o$ | 1.340 | 1.366up |
| 3726.096 | 12 | 60 | MIT | 26830.14 | $a^3G_5 - x^3F_4^o$ | 1.184 | 1.115 |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman g_1 | Effect g_2 |
|-----------|-----|-----|-------|----------|----------------------|-----------------|-----------------|
| 3725.486 | 8 | 5 | MIT | 26834.53 | $a^3P_0 - z^3S_1^o$ | 0/0 | 1.558n |
| 3724.969 | 12 | 12 | MIT | 26838.26 | $a^5P_2 - z^5P_2^o$ | 1.569 | 1.812 |
| 3722.312 | 5 | 2 | MIT | 26857.41 | $a^1D_2 - z^1D_2^o$ | 1.19 | 1.03 |
| 3719.329 | 20 | 25 | MIT | 26878.95 | $a^3H_4 - 204$ | 0.832 | 0.930 |
| 3718.400 | 8 | 2 | MIT | 26885.67 | $a^3F_4 - y^5D_3^o$ | | |
| 3717.682 | 6 | 5 | MIT | 26890.86 | $a^5D_1 - y^5F_2^o$ | | |
| 3717.004 | 30 | 25 | MIT | 26895.57 | $a^5D_3 - y^5F_4^o$ | 1.418 | 1.364up |
| 3716.179 | 12 | 8 | MIT | 26901.24 | $a^3F_4 - v^5D_4^o$ | 1.279 | 1.497 |
| 3715.562 | 12 | 8 | MIT | 26906.21 | $a^5D_2 - y^5F_2^o$ | 1.240 | 1.071 |
| 3714.624 | 8 | 1 | MIT | 26913.00 | $a^5F_1 - z^7F_2^o$ | | |
| 3712.295 | 30 | 10 | MIT | 26929.88 | $a^1D_2 - 204$ | 1.171 | 0.933 |
| 3709.097 | 5 | - | MIT | 26953.10 | $a^3D_2 - x^3D_2^o?$ | | |
| 3705.4 | - | 1+ | E+H | 26979.99 | $a^5F_1 - z^7F_1^o$ | | |
| 3705.357 | 8 | 2 | MIT | 26980.30 | $a^5F_2 - z^5F_1^o$ | | |
| 3703.206 | 12 | 3 | MIT | 26995.98 | $a^3P_2 - y^3D_1^o$ | 1.537 | 0.754 |
| 3702.240 | 6 | 3 | MIT | 27003.02 | $a^5P_2 - z^5P_1^o$ | 1.569 | 2.396 |
| 3701.848 | 5 | 0h | MIT | 27005.88 | $a^1P_1 - w^3F_2^o$ | | |
| 3701.320 | 10 | 3 | MIT | 27009.73 | $a^5F_1 - z^7F_0^o$ | 0.0 | 0/0 n |
| 3700.991 | 50 | 20 | MIT | 27012.13 | $a^3H_4 - y^1H_5^o$ | 0.840 | 1.035 |
| 3697.861 | 4 | 3 | MIT | 27034.99 | $b^3P_1 - x^3D_1^o$ | 1.43 | 0.89 |
| 3697.764 | 8 | 6 | MIT | 27035.70 | $a^5P_3 - y^5F_3^o$ | 1.625 | 1.279 |
| 3696.587 | 50 | 15 | MIT | 27044.31 | $a^3P_2 - x^5D_2^o$ | 1.534 | 1.442 |
| 3693.591 | 20 | 5 | MIT | 27066.25 | $a^3G_5 - z^3H_4^o$ | 1.197 | 0.902 |
| 3693.227 | 3 | - | MF | 27068.92 | $a^3G_3 - x^3D_3^o$ | | |
| 3685.951 | 10 | 5 | MIT | 27122.35 | $b^3P_2 - x^3D_3^o$ | 1.313 | 1.159 |
| 3685.068 | 8 | 3 | MIT | 27128.86 | $a^3D_1 - v^3D_1^o$ | 0.677 | 0.800 |
| 3683.592 | 3 | - | MIT | 27139.72 | $b^3F_2 - z^3S_1^o$ | | |
| 3682.664 | 2 | - | MF | 27146.55 | $a^3H_4 - w^5D_4^o$ | | |
| 3680.063 | 4 | - | MIT | 27165.74 | $a^5D_1 - y^5F_1^o$ | | |
| 3678.315 | 6 | 15 | MIT | 27178.65 | $a^5F_2 - z^7F_3^o?$ | | |
| 3678.059 | 4 | 2 | MIT | 27180.53 | $a^1G_4 - w^3D_3^o$ | | |
| 3677.982 | 5 | 1 | MIT | 27181.11 | $a^5D_2 - y^5F_1^o$ | | |
| 3676.955 | 8 | 3 | MIT | 27188.70 | $a^1D_2 - x^3P_2^o$ | (1.175) | 1.415p |
| 3676.670 | 8 | 4 | MIT | 27190.81 | $a^3D_1 - z^1D_2^o$ | 0.674 | 1.027 |
| 3676.408 | 5 | 2h | MIT | 27192.75 | $a^5P_3 - y^5F_2^o$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman Effect | |
|-----------|-----|-----|-------|-----------|--------------------|---------------|---------|
| | | | | | | g_1 | g_2 |
| 3675.262 | 6 | 2 | MIT | 27201.23 | $b^3P_1 - w^3F_2$ | 1.447 | 0.892 |
| 3674.626 | 5 | - | MF | 27205.93 | $a^1H_5 - 233$ | | |
| 3672.383 | 6 | 4 | MIT | 27222.55 | $a^3P_1 - y^5P_2$ | (1.684) | 1.717n |
| 3672.066 | 4 | 1 | MIT | 27224.90 | $a^3H_4 - x^5F_5$ | (0.834) | 1.303p |
| 3671.219 | 10 | 4 | MIT | 27231.19 | $a^5D_3 - y^5F_3$ | 1.426 | 1.281 |
| 3669.494 | 50 | 70 | MIT | 27243.98 | $a^3G_5 - y^3G_5$ | 1.194 | 1.146up |
| 3668.729 | 4 | 2 | MIT | 27249.67 | $a^3G_3 - z^1F_3$ | | |
| 3667.993 | 4 | - | MF | 27255.113 | $a^1D_2 - x^3P_1$ | | |
| 3667.465 | 2 | - | MF | 27259.06 | $b^3F_2 - y^5P_3$ | | |
| 3663.373 | 5 | 60 | MIT | 27289.50 | $a^5D_4 - y^5F_5$ | | |
| 3661.577 | 1 | 5 | MIT | 27302.89 | $b^3P_2 - z^1F_3$ | | |
| 3661.353 | 60 | 100 | MIT | 27304.56 | $a^5F_4 - z^3G_5$ | 1.348 | 1.237 |
| 3660.814 | 2 | 8 | MIT | 27308.58 | $a^3D_3 - v^3D_2?$ | | |
| 3657.173 | 2 | 4 | MIT | 27335.77 | $a^5F_3 - z^5F_2$ | | |
| 3655.976 | 2 | 1 | MF | 27344.72 | $a^3H_4 - x^3G_3$ | | |
| 3653.699 | - | 1 | MF | 27361.76 | $a^3D_2 - z^1P_1$ | | |
| 3652.50 | 1 | - | E+H | 27370.74 | $b^3P_2 - x^3D_1$ | | |
| 3652.316 | 2 | 5 | MIT | 27372.12 | $a^5F_2 - z^7F_1?$ | | |
| 3650.322 | 3 | 12 | MIT | 27387.07 | $a^3F_3 - y^5F_4$ | 1.199 | 1.361 |
| 3649.200 | tr | - | MF | 27395.49 | $a^1D_2 - x^3G_3$ | | |
| 3646.114 | 12 | 8 | MIT | 27418.68 | $a^3G_4 - y^3G_3$ | 1.034 | 0.894 |
| 3645.669 | tr | - | MF | 27422.02 | $b^3F_4 - x^5D_4$ | | |
| 3640.640 | 3 | 12 | MIT | 27459.90 | $a^3G_4 - z^1G_4$ | 1.03 | 1.03 n |
| 3638.016 | 1 | 4 | MIT | 27479.71 | $a^3D_2 - x^3F_2$ | 1.160 | 1.022 |
| 3637.466 | 2 | 10 | MIT | 27483.35 | $a^3G_3 - w^3F_2$ | 0.753 | 0.883 |
| 3635.516 | 2 | 8 | MIT | 27498.60 | $a^5P_1 - z^3P_2$ | 1.985 | 1.470 |
| 3634.929 | 50 | 100 | MIT | 27503.05 | $a^5F_3 - z^7F_4$ | 1.253 | 1.371 |
| 3633.921 | 2 | 5 | MIT | 27510.67 | $a^3H_4 - x^5F_4$ | | |
| 3632.409 | 2 | 1 | MF | 27522.08 | $a^3D_1 - x^3P_2$ | | |
| 3631.711 | 2 | 8 | MIT | 27527.41 | $a^3F_4 - z^5P_3$ | 1.280 | 1.644 |
| 3627.289 | 2 | 4 | MIT | 27560.80 | $a^3G_3 - w^3F_3$ | | |
| 3626.744 | 3 | 40 | MIT | 27565.11 | $a^3H_4 - w^3G_4$ | 0.840 | 0.919up |
| 3625.196 | 4 | 30 | MIT | 27576.88 | $a^3P_2 - x^5D_1$ | (1.534) | 1.558n |
| 3623.635 | 2 | 10 | MIT | 27588.76 | $b^3F_3 - y^3F_4$ | | |
| 3620.285 | 2 | 5 | MIT | 27614.29 | $b^3P_2 - w^3F_3$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman g_1 | Effect g_2 |
|-----------|-----|-----|-------|----------|----------------------|-----------------|-----------------|
| 3619.202 | 2 | 9 | MIT | 27622.56 | $a^3G_4 - y^3G_4^0$ | 1.030 | 1.195 |
| 3616.951 | 2 | 4 | MIT | 27639.74 | $b^3F_4 - x^5D_3^0$ | 1.256 | 1.424 |
| 3616.057 | tr | - | MF | 27646.58 | $a^1G_4 - w^3F_4^0$ | | |
| 3609.107 | 3 | 4 | MIT | 27699.81 | $a^5F_4 - z^5F_3^0$ | | |
| 3608.727 | 2 | 8 | MIT | 27702.73 | $a^5D_2 - x^5D_3^0$ | 1.239 | 1.430 |
| 3607.426 | tr | - | MF | 27712.72 | $a^3D_3 - z^1D_2^0$ | | |
| 3606.153 | 2 | 1 | MIT | 27722.50 | $a^3F_3 - y^5F_3^0$ | | |
| 3605.641 | 2 | 9 | MIT | 27726.44 | $a^5P_1 - z^3P_1^0$ | 1.979 | 1.308 |
| 3601.485 | 2 | 5 | MIT | 27758.43 | $a^3H_5 - y^5G_6^0$ | 1.041 | 1.220 |
| 3599.764 | 12 | 100 | MIT | 27771.70 | $a^5P_3 - x^5D_4^0$ | 1.615 | 1.479 |
| 3599.400 | 2 | 3 | MIT | 27774.51 | $b^3P_1 - w^3D_2^0$ | | |
| 3598.476 | 2 | 1 | MF | 27781.64 | $a^3F_2 - y^3D_2^0$ | | |
| 3596.179 | 30 | 100 | MIT | 27799.40 | $a^5F_3 - z^3G_4^0$ | | |
| 3593.022 | 60 | 150 | MIT | 27823.82 | $a^5F_2 - z^5G_3^0$ | | |
| 3591.343 | tr | - | MF | 27836.82 | $b^3P_2 - x^3F_3^0$ | | |
| 3590.886 | 2 | 4 | MIT | 27840.37 | $a^3D_2 - w^3D_1^0$ | 1.168 | 0.809 |
| 3589.215 | 60 | 100 | MIT | 27853.32 | $a^5F_1 - z^5G_2^0$ | 0.000 | 0.373 |
| 3587.203 | 5 | 70 | MIT | 27868.97 | $a^3H_5 - y^1H_5^0$ | 1.036 | 1.036n |
| 3585.820 | - | 10h | E+H | 27879.70 | $a^3F_3 - y^5F_2^0$ | | |
| 3584.198 | 2 | 6 | MIT | 27892.27 | $a^5D_1 - y^3D_2^0$ | 1.792 | 1.171 |
| 3579.768 | 3 | 8 | MIT | 27926.82 | $a^5F_3 - z^7F_2^0$ | 1.249 | 1.497 |
| 3578.688 | 3 | 4h | MF | 27935.27 | $a^3F_2 - z^3P_2^0$ | | |
| 3577.538 | 3 | 5 | MF | 27944.24 | $a^3D_2 - y^1F_3^0$ | | |
| 3575.041 | 2 | - | MF | 27963.66 | $a^3P_2 - z^3S_1^0$ | | |
| 3574.577 | 4 | 15 | MIT | 27967.38 | $a^5D_3 - x^5D_4^0?$ | | |
| 3573.68 | 1 | - | E+H | 27974.40 | $a^3H_4 - w^5D_3^0$ | | |
| 3572.015 | 3 | 5 | MIT | 27987.44 | $a^3P_1 - y^5P_1^0$ | 1.684 | 2.321 |
| 3571.759 | 3 | 5 | MF | 27989.45 | $a^5P_3 - x^5D_3^0$ | | |
| 3567.73 | - | 1h | E+H | 28021.05 | $a^3P_0 - y^5P_1^0$ | | |
| 3567.155 | 3 | 9 | MIT | 28025.57 | $b^3P_1 - x^3D_2^0$ | 1.442 | 1.005 |
| 3564.798 | 2 | 5 | MIT | 28044.09 | $a^3D_3 - x^3P_2^0$ | | |
| 3564.562 | 4 | 5 | MIT | 28045.96 | $a^5D_1 - z^3P_2^0$ | 1.81 | 1.48 |
| 3564.353 | 3 | 6 | MIT | 28047.61 | $a^5P_1 - x^5D_2^0$ | | |
| 3563.578 | 2 | - | MF | 28053.70 | $a^1H_5 - 239$ | | |
| 3563.141 | 2 | 3 | MIT | 28057.14 | $a^3G_3 - w^3D_2^0$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman g_1 | Effect g_2 |
|-----------|-----|-----|-------|----------|---------------------|-----------------|-----------------|
| 3562.616 | 2 | 3 | MIT | 28061.28 | $a^5D_2 - z^3P_2^0$ | | |
| 3561.894 | 2 | 5 | MIT | 28066.96 | $b^3P_0 - w^3D_1^0$ | 0/0 | 0.81ln |
| 3561.562 | 2 | 1 | MF | 28069.58 | $a^3G_5 - z^1G_4^0$ | | |
| 3560.177 | 2 | - | MF | 28080.50 | $a^5F_1 - z^5S_2^0$ | | |
| 3559.879 | 3 | 2 | MF | 28082.85 | $a^3P_2 - y^5P_3^0$ | | |
| 3557.058 | 3 | 5 | MIT | 28105.12 | $a^3H_4 - x^5F_3^0$ | | |
| 3556.626 | 3 | 5 | MIT | 28108.54 | $a^3P_1 - y^3P_0^0$ | 1.680 | 0/0 n |
| 3556.382 | 2 | - | MIT | 28110.46 | $b^3P_2 - w^3D_2^0$ | | |
| 3554.262 | 2 | 1 | MF | 28127.23 | $a^5D_0 - y^3D_1^0$ | | |
| 3553.848 | 4 | 10 | MIT | 28130.51 | $a^3P_1 - y^3P_0^0$ | 1.679 | 1.606 |
| 3553.668 | 5 | 1 | MIT | 28131.93 | $a^3G_4 - z^1F_3^0$ | | |
| 3550.630 | 4 | 5 | MIT | 28156.00 | $a^1D_2 - x^5F_3^0$ | | |
| 3550.269 | 4 | 8 | MIT | 28158.87 | $a^5F_3 - z^7P_4^0$ | 1.253 | 1.658 |
| 3549.735 | 3 | 5 | MIT | 28163.10 | $a^3F_2 - z^3P_1^0$ | | |
| 3549.623 | 2 | - | MF | 28163.99 | $a^3P_0 - y^3P_1^0$ | | |
| 3547.380 | 3 | 2 | MF | 28181.77 | $a^3G_3 - w^3D_3^0$ | | |
| 3547.181 | 3 | 2 | MF | 28183.38 | $a^3F_2 - y^3D_3^0$ | | |
| 3546.982 | 2 | 5 | MIT | 28184.96 | $a^5D_3 - x^5D_3^0$ | 1.42 | 1.42 n |
| 3546.012 | 2 | - | MF | 28192.67 | $a^3H_6 - y^5G_5^0$ | | |
| 3545.806 | 2 | - | MF | 28194.31 | $a^5P_3 - y^3D_2^0$ | | |
| 3541.631 | 60 | 10 | MIT | 28227.54 | $a^3F_4 - y^5F_5^0$ | 1.294 | 1.407 |
| 3541.046 | 10 | - | MIT | 28232.20 | $a^3G_5 - y^3G_4^0$ | 1.18 | 1.18 |
| 3540.678 | 4 | - | MF | 28235.14 | $b^3P_2 - w^3D_3^0$ | | |
| 3539.369 | 60 | 15 | MIT | 28245.58 | $a^5F_2 - z^5G_2^0$ | 1.001 | 0.378 |
| 3539.263 | 30 | 5 | MIT | 28246.43 | $b^3F_4 - y^3D_3^0$ | | |
| 3537.951 | 70 | 25 | MIT | 28256.90 | $a^5F_3 - z^3F_4^0$ | (1.249) | 1.269n |
| 3536.567 | 50 | - | MIT | 28267.96 | $a^3H_4 - A214$ | | |
| 3535.831 | 60 | 12 | MIT | 28273.84 | $a^5D_1 - z^3P_1^0$ | 1.796 | 1.312 |
| 3535.372 | 30 | 8 | MIT | 28277.50 | $a^5F_4 - z^7F_5^0$ | | |
| 3535.307 | 5 | - | MIT | 28278.03 | $a^1G_4 - z^3I_5^0$ | | |
| 3535.052 | 10 | 1 | MIT | 28280.07 | $b^3P_0 - y^3S_1^0$ | | |
| 3533.913 | 6 | - | MIT | 28289.19 | $a^5D_2 - z^3P_1^0$ | | |
| 3532.814 | 60 | 12 | MIT | 28297.99 | $a^1G_4 - y^1F_3^0$ | 0.99 | 0.99 n |
| 3531.390 | 60 | 9 | MIT | 28309.40 | $a^5D_2 - y^3D_3^0$ | 1.241 | 1.390 |
| 3529.276 | 30 | 3 | MIT | 28326.36 | $b^3F_2 - z^3D_1^0$ | | |
| 3528.683 | 60 | 12 | MIT | 28331.12 | $a^5F_2 - z^3D_3^0$ | 1.002 | 1.204 |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman g_1 | Effect g_2 |
|-----------|------|-----|-------|----------|---------------------|-----------------|-----------------|
| 3526.575 | 12 | 3 | MIT | 28348.05 | $a^5P_3 - z^3P_2^o$ | | |
| 3525.817 | 5 | - | MIT | 28354.14 | $b^3F_3 - y^5P_2^o$ | | |
| 3524.902 | 12 | 2 | MIT | 28361.50 | $b^3P_2 - x^3D_2^o$ | | |
| 3524.152 | 6 | - | MIT | 28367.54 | $a^3H_5 - x^5F_4^o$ | | |
| 3522.276 | 10 | 8R | MIT | 28382.65 | $b^3F_3 - x^3F_4^o$ | | |
| 3521.968 | 8 | 5R | MIT | 28385.13 | $a^3P_2 - y^5P_2^o$ | | |
| 3521.393 | 7 | - | MF | 28389.77 | $a^5D_3 - y^3D_2^o$ | | |
| 3520.130 | 60 | 40 | MIT | 28399.95 | $a^5D_1 - z^3P_0^o$ | 1.791 | 0/0 n |
| 3519.635 | 70 | 30 | MIT | 28403.94 | $a^5F_4 - z^7F_4^o$ | 1.350 | 1.364up |
| 3518.983 | 30 | 3 | MIT | 28409.21 | $a^3G_5 - z^1H_5^o$ | | |
| 3517.994 | 4 | - | MF | 28417.19 | $a^3D_3 - x^5F_4^o$ | | |
| 3517.407 | 10 | - | MIT | 28421.94 | $a^3H_5 - w^3G_4^o$ | | |
| 3516.948 | 2 | - | MF | 28425.64 | $a^3H_4 - 216$ | | |
| 3515.894 | 10 | 8R | MIT | 28434.17 | $b^3P_1 - z^1P_0^o$ | | |
| 3515.678 | 10 | 8R | MIT | 28435.91 | $a^3F_2 - y^3D_1^o$ | | |
| 3514.766 | 12 | 4 | MIT | 28443.30 | $a^3G_4 - w^3F_3^o$ | | |
| 3514.488 | 70 | 40 | MIT | 28445.54 | $a^5F_3 - z^5G_3^o$ | 1.247 | 0.941 |
| 3514.141 | 4 | - | MIT | 28446.35 | $a^3H_6 - y^5G_6^o$ | | |
| 3513.299 | 5 | - | MF | 28455.17 | $a^3D_2 - v^3D_2^o$ | | |
| 3512.882 | 8 | - | MIT | 28458.54 | $a^3F_3 - x^5D_4^o$ | | |
| 3511.560 | 6 | - | MIT | 28469.30 | $b^3F_2 - y^3P_1^o$ | | |
| 3511.291 | 2 | - | MIT | 28471.44 | $a^3D_3 - w^3G_4^o$ | | |
| 3511.126 | 8 | - | MIT | 28472.78 | $a^5F_2 - z^5S_2^o$ | | |
| 3509.717 | 50 | 2 | MIT | 28484.21 | $a^3F_2 - x^5D_2^o$ | | |
| 3508.370 | 4 | - | MF | 28495.14 | $a^5F_5 - z^3G_5^o$ | | |
| 3507.319 | 12 | - | MF | 28503.68 | $a^1D_2 - w^3G_3^o$ | | |
| 3502.640 | tr | - | MF | 28541.76 | $a^1H_5 - B242$ | | |
| 3502.418 | 20 | 4 | MIT | 28543.57 | $a^5D_3 - z^3P_2^o$ | (1.420) | 1.460n |
| 3502.045 | 3 | - | MF | 28546.61 | $a^5D_1 - y^3D_1^o$ | | |
| 3501.354 | 30 | 3 | MIT | 28552.24 | $b^3P_1 - x^3F_2^o$ | 1.449 | 1.027 |
| 3500.528 | 5 | - | MF | 28558.98 | $a^3H_6 - y^1H_5^o$ | | |
| 3500.162 | 2 | - | MF | 28561.97 | $a^5D_2 - y^3D_1^o$ | | |
| 3498.942 | 500R | 200 | MIT | 28571.92 | $a^5F_5 - z^5G_6^o$ | (1.397) | 1.379n |
| 3497.937 | 30 | 8 | MIT | 28580.13 | $a^5P_1 - x^5D_1^o$ | 1.985 | 1.573 |
| 3497.611 | 3 | - | MF | 28582.80 | $a^3H_5 - 211$ | | |

| λ | Arc | Spk | Auth. | \sim | Comb. | Zeeman g_1 | Effect g_2 |
|-----------|-----|-----|-------|----------|---------------------|-----------------|-----------------|
| 3496.127 | 12 | - | MIT | 28594.93 | $a^5D_1 - x^5D_2^0$ | | |
| 3495.973 | 60 | 10 | MIT | 28596.19 | $a^5P_3 - y^3D_3^0$ | 1.628 | 1.389 |
| 3494.251 | 50 | 8 | MIT | 28610.28 | $a^5D_2 - x^5D_2^0$ | 1.237 | 1.441 |
| | | | | or | $a^3D_3 - y^5G_3^0$ | | |
| 3493.220 | 20 | 1 | MIT | 28618.72 | $b^3F_3 - z^3H_4^0$ | | |
| 3490.716 | 12 | 2 | MIT | 28639.25 | $b^3P_1 - z^1S_0$ | 1.441 | 0/0 n |
| 3489.749 | 12 | - | MIT | 28647.19 | $a^3P_1 - y^3F_2^0$ | | |
| 3488.338 | tr | - | MF | 28658.77 | $a^3H_4 - w^3G_5^0$ | | |
| 3487.456 | 5 | - | MIT | 28666.02 | $a^3G_4 - x^3F_3^0$ | | |
| 3486.789 | 30 | - | MIT | 28671.32 | $a^5F_2 - z^7P_3^0$ | | |
| 3486.206 | 20 | - | MIT | 28676.30 | $a^3F_3 - x^5D_3^0$ | | |
| 3483.292 | 60 | 10 | MIT | 28700.29 | $a^5F_4 - z^3G_4^0$ | | |
| 3483.25 | - | 1 | E+H | 28700.64 | $a^3D_3 - y^5G_2^0$ | | |
| 3483.159 | 50 | 8 | MIT | 28701.39 | $a^5F_4 - z^7F_3^0$ | | |
| 3482.341 | 30 | 3 | MIT | 28708.12 | $a^5D_0 - x^5D_1^0$ | | |
| 3481.297 | 70 | 35 | MIT | 28716.74 | $a^5P_2 - x^5D_3^0$ | 1.557 | 1.420 |
| 3479.774 | 3 | - | MF | 28729.30 | $a^5D_1 - x^5D_0^0$ | | |
| 3477.931 | tr | - | MF | 28744.53 | $a^1D_2 - w^5D_2^0$ | | |
| 3474.843 | 20 | 4 | MIT | 28770.07 | $b^5P_2 - z^1P_1^0$ | | |
| 3474.641 | 2 | - | MF | 28771.74 | $a^3H_6 - x^5F_5^0$ | | |
| 3473.746 | 70 | 35 | MIT | 28779.16 | $b^3F_3 - y^3F_3^0$ | 1.083 | 0.970 |
| 3472.653 | 12 | 3 | MIT | 28788.22 | $b^3F_2 - y^3G_3^0$ | | |
| 3472.231 | 60 | 9 | MIT | 28791.71 | $a^5D_3 - y^3D_3^0$ | 1.419 | 1.389 |
| 3470.002 | 3 | - | MF | 28810.21 | $a^3P_2 - y^3F_3^0$ | | |
| 3467.046 | 50 | 3 | MIT | 28834.77 | $a^3G_3 - x^3F_2^0$ | 0.754 | 1.020 |
| 3465.286 | 5 | 2h | MIT | 28849.41 | $a^3D_2 - z^1D_2^0$ | | |
| 3463.144 | 60 | 4 | MIT | 28867.26 | $a^5F_3 - z^5G_2^0$ | | |
| 3461.924 | 30 | - | MIT | 28877.43 | $a^1D_2 - u^3D_2^0$ | | |
| 3461.525 | tr | - | MF | 28880.76 | $a^3D_3 - w^5D_3^0$ | | |
| 3461.466 | tr | - | MF | 28881.25 | $a^3F_3 - y^3D_2^0$ | | |
| 3460.642 | 7 | - | MF | 28888.13 | $b^3P_2 - x^3F_2^0$ | | |
| 3459.569 | 30 | - | MIT | 28897.09 | $a^5P_3 - x^5D_2^0$ | (1.624) | 1.446 |
| 3457.689 | 4 | - | MF | 28912.80 | $b^3P_1 - w^3D_1^0$ | | |
| 3456.620 | 60 | 8 | MIT | 28921.74 | $a^3D_2 - 204^0$ | 1.164 | 0.938 |
| 3455.732 | 12 | - | MIT | 28929.17 | $a^5D_2 - 161^0$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman Effect | |
|-----------|------|-----|-------|----------|----------------------|---------------|---------|
| | | | | | | g_1 | g_2 |
| 3452.903 | 60 | 6 | MIT | 28952.87 | $a^5F_3 - z^3D_3^o$ | 1.24 | 1.21 up |
| 3451.216 | 3 | - | MF | 28967.03 | $a^5P_1 - z^3S_1^o$ | | |
| 3450.819 | 2 | - | MF | 28970.36 | $a^3H_4 - 222$ | | |
| 3448.953 | 70 | 20 | MIT | 28986.03 | $b^3F_2 - y^3F_2^o$ | 0.763 | 0.890 |
| 3446.070 | 50 | 6 | MIT | 29010.28 | $a^1D_2 - u^3D_1^o$ | (1.175) | 1.118n |
| 3445.939 | 10 | - | MIT | 29011.39 | $a^3D_3 - x^5F_3^o$ | | |
| 3445.609 | tr | - | MIT | 29014.16 | $b^3P_0 - x^3D_1^o$ | | |
| 3445.301 | 12 | - | MIT | 29016.75 | $a^3F_2 - x^5D_1^o$ | | |
| 3443.155 | 30 | 1 | MIT | 29034.84 | $a^3F_3 - z^3P_2^o$ | (1.196) | 1.464p |
| 3442.241 | 2 | - | MF | 29042.55 | $a^1G_4 - y^5G_5^o$ | | |
| 3440.205 | 100 | 30 | MIT | 29059.74 | $a^5D_4 - x^5D_4^o$ | 1.440 | 1.475 |
| | | | | and | $a^5F_4 - z^7P_4^o$ | 1.349 | 1.658 |
| 3439.676 | 30 | - | MIT | 29064.21 | $a^3G_4 - w^3D_3^o$ | | |
| 3438.368 | 70 | 35 | MIT | 29075.26 | $a^5P_2 - z^3P_2^o$ | 1.564 | 1.474 |
| 3436.737 | 300R | 150 | MIT | 29089.06 | $a^5F_4 - z^5G_5^o$ | 1.34 | 1.26 |
| 3436.332 | 12 | 8 | MIT | 29092.49 | $a^5D_3 - x^5D_2^o$ | | |
| 3436.059 | 3 | - | MF | 29094.80 | $a^5D_0 - z^3S_1^o$ | | |
| 3435.186 | 60 | 20 | MIT | 29102.19 | $a^5F_1 - z^3D_2^o$ | 0.000 | 1.028 |
| 3433.260 | 60 | 25 | MIT | 29118.52 | $a^3P_2 - y^3P_2^o$ | 1.533 | 1.301 |
| 3432.741 | 70 | 40 | MIT | 29122.92 | $b^3F_4 - y^3F_4^o$ | 1.254 | 1.109 |
| 3432.373 | 5 | - | MIT | 29126.04 | $b^3P_1 - y^3S_1^o?$ | | |
| 3432.209 | 50 | 12 | MIT | 29127.43 | $a^5D_1 - x^5D_1^o$ | | |
| 3430.772 | 70 | 45 | MIT | 29139.64 | $a^5F_2 - z^3G_3^o$ | 0.999 | 0.869 |
| 3430.374 | 4 | - | MF | 29143.02 | $a^5D_2 - x^5D_1^o$ | | |
| 3429.542 | 60 | 25 | MIT | 29150.09 | $a^3P_2 - y^5P_1^o$ | 1.534 | 2.314 |
| 3428.634 | 30 | 12 | MIT | 29157.80 | $a^5F_4 - z^3F_4^o$ | | |
| 3428.309 | 100 | 100 | MIT | 29160.57 | $a^5F_5 - z^7F_6^o$ | 1.404 | 1.462 |
| 3426.456 | 6 | - | MIT | 29176.34 | $a^3H_4 - 225$ | | |
| 3425.964 | 30 | 4 | MIT | 29180.53 | $a^3D_2 - x^3P_2^o$ | 1.162 | 1.420 |
| 3424.208 | 2 | - | MF | 29195.49 | $a^3G_3 - w^3D_1^o$ | | |
| 3422.45 | 1 | - | MF | 29210.69 | $a^3D_1 - u^3D_2^o$ | | |
| 3421.793 | 3 | - | MF | 29215.98 | $a^5P_3 - 161$ | | |
| 3420.078 | 60 | 8 | MIT | 29230.75 | $a^3P_1 - x^3D_1^o$ | 1.686 | 0.890 |
| 3419.252 | 30 | 2 | MIT | 29237.81 | $a^5F_1 - z^7P_2^o$ | 0.000 | 2.061 |
| 3418.166 | 5 | - | MF | 29247.10 | $a^3D_2 - x^3P_1^o$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman g_1 | Effect g_2 |
|-----------|-----|-----|-------|----------|---|-----------------|-----------------|
| 3417.961 | 60 | - | MIT | 29248.71 | $b^3P_2 - w^3D_1^o$ | | |
| 3417.353 | 200 | 70 | MIT | 29254.06 | $a^5F_3 - z^5G_4^o$ | 1.244 | 1.113 |
| 3416.182 | 50 | 4 | MIT | 29264.08 | $a^3P_0 - x^3D_1^o$ | 0/0 | 0.898n |
| 3414.839 | 20 | - | MF | 29275.59 | $a^1G_4 - 204$ | | |
| 3414.642 | 50 | 5 | MIT | 29277.28 | $a^5D_4 - x^5D_3^o$ | (1.447) | 1.434n |
| 3413.980 | 3 | - | MIT | 29282.96 | $a^3F_3 - y^3D_3^o$ | | |
| 3413.714 | 3 | - | MIT | 29285.24 | $a^3D_3 - u^3D_3^o$ | | |
| 3413.350 | 5 | - | MF | 29288.36 | $a^3H_5 - 216$ | | |
| 3412.800 | 50 | 5 | MIT | 29293.08 | $a^5F_3 - z^7P_3^o$ or $a^3P_2 - y^3P_1^o$ | | |
| 3412.078 | 30 | - | MIT | 29299.27 | $a^3G_3 - y^1F_3^o$ | | |
| 3411.636 | 80 | 12 | MIT | 29303.07 | $a^5P_2 - z^3P_1^o$ | 1.571 | 1.318 |
| 3409.568 | 20 | 2 | MIT | 29320.85 | $b^3F_2 - x^3D_3^o$ | | |
| 3409.277 | 100 | 40 | MIT | 29323.36 | $a^5P_2 - y^3D_3^o$ | 1.556 | 1.380 |
| 3407.579 | 5 | - | MF | 29337.96 | $a^3D_3 - 216$ | | |
| 3406.917 | 4 | - | MIT | 29343.66 | $a^3D_1 - u^3D_1^o$ | | |
| 3406.591 | 50 | 3 | MIT | 29346.47 | $a^5F_4 - z^5G_3^o$ | | |
| 3405.880 | 50 | 2 | MIT | 29352.60 | $b^3P_2 - y^1F_3^o$ | 1.319 | 0.995 |
| 3403.775 | 8 | - | MIT | 29370.75 | $a^3G_5 - z^3I_6^o$ | | |
| 3401.739 | 100 | 50 | MIT | 29388.33 | $a^5P_1 - y^5P_2^o$ | 1.984 | 1.712 |
| 3401.505 | 30 | 2 | MIT | 29390.35 | $a^3D_1 - w^5D_0^o$ | 0.673 | 0/0 n |
| 3400.754 | 30 | 1 | MIT | 29396.84 | $a^3P_1 - w^3F_2^o$ | | |
| 3400.604 | 10 | - | MIT | 29398.13 | $a^3H_4 - A226$ | | |
| 3399.974 | 4 | - | MIT | 29403.58 | $a^3F_2 - z^3S_1^o$ | | |
| 3399.375 | 60 | 3 | MIT | 29408.76 | $a^1G_4 - y^1H_5^o$ | | |
| 3393.257 | 3 | - | MF | 29461.79 | $b^3P_2 - y^3S_1^o$ | | |
| 3392.537 | 100 | 40 | MIT | 29468.04 | $a^5F_5 - z^7F_5^o$ | 1.404 | 1.478 |
| 3392.033 | 7 | - | MIT | 29472.51 | $a^5P_3 - y^3F_4^o$ | | |
| 3391.890 | 50 | 6 | MIT | 29473.66 | $b^3P_0 - x^3P_1^o$ | 0/0 | 1.348n |
| 3390.910 | 12 | - | MF | 29482.18 | $a^1D_2 - 227$ | (1.175) | 1.078p |
| 3389.500 | 60 | 18 | MIT | 29494.44 | $a^5F_2 - z^3D_2^o$ | 1.002 | 1.026up |
| 3388.709 | 80 | 20 | MIT | 29501.32 | $b^3F_2 - z^1F_3^o$ | 0.764 | 1.136 |
| 3387.232 | 30 | 2 | MIT | 29514.19 | $a^5D_1 - z^3S_1^o$ | | |
| 3386.251 | 30 | 2 | MIT | 29522.73 | $a^3F_2 - y^5P_3^o$ | | |
| 3385.707 | 50 | 4 | MIT | 29527.48 | $b^3F_1 - v^3D_2^o$ | 1.435 | 1.156 |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman g_1 | Effect g_2 |
|-----------|-----|-----|-------|----------|---------------------|-----------------|-----------------|
| 3385.474 | 8 | 2 | MIT | 29529.51 | $a^5D_2 - z^3S^0_1$ | | |
| 3385.385 | 3 | - | MF | 29530.29 | $a^3G_4 - w^3F^0_4$ | | |
| 3385.144 | 60 | 35 | MIT | 29532.39 | $a^3G_5 - x^3G^0_5$ | 1.194 | 1.194n |
| 3380.915 | 10 | 2 | MIT | 29569.33 | $b^3F_2 - x^3D^0_1$ | | |
| 3380.175 | 60 | 15 | MIT | 29575.81 | $a^5P_2 - y^3D^0_1$ | 1.570 | 0.764 |
| 3379.605 | 60 | 18 | MIT | 29580.79 | $b^3F_3 - y^3G^0_3$ | 1.082 | 0.888 |
| 3379.264 | 30 | 2 | MIT | 29583.78 | $a^3F_3 - x^5D^0_2$ | | |
| 3379.029 | 20 | - | MIT | 29585.83 | $b^3F_2 - y^5P^0_3$ | | |
| 3378.020 | 60 | 12 | MIT | 29594.67 | $a^5F_5 - z^7F^0_4$ | (1.397) | 1.374n |
| 3376.053 | 5 | - | MIT | 29611.92 | $a^3P_2 - y^3G^0_3$ | | |
| 3374.903 | 30 | 1 | MIT | 29622.00 | $b^3F_3 - z^1G^0_4$ | | |
| 3374.646 | 80 | 18 | MIT | 29624.26 | $a^5P_2 - x^5D^0_2$ | 1.557 | 1.447 |
| 3373.978 | 60 | 4 | MIT | 29630.12 | $a^5F_2 - z^7P^0_2$ | | |
| 3371.860 | 70 | 18 | MIT | 29648.74 | $a^5D_2 - y^5P^0_3$ | 1.237 | 1.631 |
| 3369.669 | 30 | 2 | MIT | 29668.01 | $a^5D_3 - y^3F^0_4$ | | |
| 3368.451 | 100 | 60 | MIT | 29678.74 | $a^5F_2 - z^3F^0_3$ | 1.003 | 1.131 |
| 3362.335 | 50 | 5h | MIT | 29732.73 | $a^3D_3 - u^3D^0_2$ | 1.333 | 1.087 |
| 3362.003 | 60 | 8 | MIT | 29735.66 | $b^3F_2 - w^3F^0_2$ | 0.765 | 0.883 |
| 3359.519 | 2 | - | MF | 29757.64 | $a^1D_2 - 230$ | | |
| 3359.095 | 70 | 20 | MIT | 29761.40 | $a^5F_3 - z^3G^0_3$ | 1.245 | 0.868 |
| 3357.157 | 2 | - | MF | 29778.58 | $b^3F_3 - y^3F^0_2$ | | |
| 3356.461 | 10 | - | MIT | 29784.76 | $b^3F_3 - y^3G^0_4$ | | |
| 3356.199 | 30 | 3 | MIT | 29787.08 | $a^3D_1 - B226$ | 0.70 | 0/0 n |
| 3353.648 | 50 | 4 | MIT | 29809.74 | $a^3P_2 - y^3F^0_2$ | | |
| 3353.308 | 30 | 15 | MIT | 29812.76 | $b^3F_2 - w^3F^0_3$ | | |
| 3352.976 | 6 | - | MIT | 29815.71 | $a^3D_1 - 227$ | | |
| 3351.932 | 50 | 4 | MIT | 29825.00 | $a^3F_2 - y^5P^0_2$ | (1.089) | 1.716p |
| 3351.710 | 2 | - | MF | 29826.97 | $a^3H_5 - 222$ | | |
| 3350.549 | 12 | - | MIT | 29837.31 | $a^3D_2 - y^5G^0_2$ | | |
| 3348.705 | 50 | 2 | MIT | 29853.74 | $a^5F_4 - z^3D^0_3$ | (1.349) | 1.207p |
| 3348.012 | 50 | 3 | MIT | 29859.92 | $b^3P_1 - v^3D^0_1$ | | |
| 3347.613 | 60 | 6 | MIT | 29863.48 | $b^3P_2 - v^3D^0_2$ | 1.316 | 1.160 |
| 3345.317 | 60 | 5 | MIT | 29883.97 | $a^5D_4 - y^3D^0_3$ | (1.447) | 1.393n |
| 3344.532 | 60 | 6 | MIT | 29890.99 | $a^5F_5 - z^3G^0_4$ | | |
| 3344.266 | 2 | - | MF | 29893.37 | $a^1H_5 - 244$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman Effect | |
|-----------|-----|-----|-------|----------|------------------------|---------------|-------|
| | | | | | | g_1 | g_2 |
| 3343.451 | 2 | - | MF | 29900.65 | $a^1D_2 - 231$ | | |
| 3342.707 | 3 | - | MIT | 29907.31 | $a^1G_4 - x^5F_4^o$ | | |
| 3341.664 | 70 | 50 | MIT | 29916.64 | $b^3F_4 - x^3F_4^o$ | 1.257 | 1.119 |
| 3341.087 | 50 | 5 | MIT | 29921.81 | $b^3P_1 - z^1D_2^o$ | | |
| 3339.552 | 100 | 60 | MIT | 29935.56 | $a^5D_1 - y^5P_2^o$ | | |
| | | | | | or $a^5P_3 - y^5P_3^o$ | | |
| 3338.707 | 30 | 3 | MIT | 29943.14 | $a^5P_2 - 161$ | | |
| 3337.823 | 60 | 8 | MIT | 29951.06 | $a^5D_2 - y^5P_2^o$ | | |
| 3336.639 | 50 | 4 | MIT | 29961.69 | $a^1G_4 - w^3G_4^o$ | | |
| 3335.686 | 70 | 12 | MIT | 29970.35 | $a^3P_1 - w^3D_2^o$ | 1.685 | 1.179 |
| 3332.643 | 60 | 5 | MIT | 29997.62 | $a^3F_4 - x^5D_4^o$ | 1.276 | 1.481 |
| 3332.320 | 3 | 0h | MIT | 30000.53 | $a^1D_2 - A231$ | | |
| 3332.052 | 60 | 10 | MIT | 30002.94 | $z^7P_3^o - 63$ | | |
| 3328.456 | 12 | - | MIT | 30035.35 | $b^3F_2 - x^3F_3^o$ | | |
| 3327.708 | 50 | 6 | MIT | 30042.10 | $z^5G_4^o - 63$ | | |
| 3324.995 | 60 | 12 | MIT | 30066.61 | $a^5F_1 - z^3F_2^o$ | 0.000 | 1.020 |
| | | | | | or $a^1H_5 - B244$ | | |
| 3323.244 | tr | - | MIT | 30082.45 | $a^3D_3 - 225$ | | |
| 3321.254 | 12 | - | MIT | 30100.48 | $a^1G_4 - y^5G_3^o$ | | |
| 3319.808 | 6 | - | MIT | 30113.59 | $b^3F_3 - x^3D_3^o$ | | |
| 3319.524 | 10 | - | MIT | 30116.16 | $a^5F_3 - z^3D_2^o$ | | |
| 3318.908 | 12 | 3 | MIT | 30121.76 | $a^5P_1 - y^3P_1^o$ | | |
| 3318.822 | 50 | 8 | MIT | 30122.53 | $a^1G_4 - 211$ | | |
| 3317.888 | 50 | 12 | MIT | 30131.02 | $a^5D_3 - y^5P_3^o$ | 1.428 | 1.635 |
| 3316.902 | 5 | 50 | MIT | 30139.97 | $a^3G_5 - w^3F_4^o$ | | |
| 3316.386 | 80 | - | MIT | 30144.66 | $a^3P_2 - x^3D_3^o$ | 1.533 | 1.158 |
| 3315.442 | 30 | 5 | MIT | 30153.24 | $a^5P_1 - y^5P_1^o$ | | |
| 3315.228 | 60 | 25 | MIT | 30155.19 | $a^5F_4 - z^5G_4^o$ | 1.340 | 1.111 |
| 3315.047 | 50 | 12 | MIT | 30156.84 | $a^5P_2 - x^5D_1^o$ | 1.56 | 1.56 |
| 3314.774 | 20 | 1 | MIT | 30159.32 | $a^3F_3 - y^3F_4^o$ | | |
| 3312.329 | 2 | - | MF | 30181.58 | $a^3G_4 - y^1F_3^o$ | | |
| 3310.957 | 30 | 5 | MIT | 30194.09 | $a^5F_4 - z^7P_3^o$ | 1.356 | 1.906 |
| 3310.086 | 4 | - | MIT | 30202.03 | $a^1D_2 - w^3F_2^o$ | | |
| 3309.825 | 4 | - | MIT | 30204.41 | $a^3G_3 - z^1D_2^o$ | | |
| 3309.223 | tr | - | MF | 30209.91 | $a^3D_3 - 226$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman g_1 | Effect g_2 |
|-----------|-----|-----|-------|----------|---------------------|-----------------|-----------------|
| 3308.626 | 10 | - | MIT | 30215.36 | $a^3F_4 - x^5D_3^o$ | | |
| 3307.984 | 50 | - | MIT | 30221.22 | $a^3P_1 - x^3D_2^o$ | | |
| 3306.172 | 60 | 12 | MIT | 30237.79 | $a^5P_3 - y^5P_2^o$ | (1.624) | 1.702n |
| 3305.655 | 4 | - | MF | 30242.52 | $a^3H_4 - 234$ | | |
| 3304.825 | 50 | 3 | MIT | 30250.11 | $a^3F_2 - y^3F_3^o$ | | |
| 3304.639 | 6 | - | MIT | 30251.81 | $a^5F_3 - z^7P_2^o$ | | |
| 3304.507 | 12 | 2 | MIT | 30253.02 | $b^3P_1 - x^3P_2^o$ | 1.42 | 1.42 n |
| 3304.303 | 3 | - | MF | 30254.89 | $a^3H_5 - A226$ | | |
| 3303.995 | 60 | 8 | MIT | 30257.71 | $b^3P_2 - z^1D_2^o$ | 1.317 | 1.028 |
| 3302.187 | 6 | - | MF | 30274.28 | $a^5P_1 - y^3P_0^o$ | | |
| 3301.911 | 30 | 8 | MIT | 30276.80 | $a^3G_3 - 204$ | | |
| 3301.587 | 70 | 40 | MIT | 30279.78 | $a^5F_5 - z^5G_5^o$ | 1.396 | 1.268 |
| 3299.791 | 3 | - | MIT | 30296.26 | $a^5P_1 - y^3P_1^o$ | | |
| 3299.334 | 50 | 4 | MIT | 30300.45 | $a^5F_3 - z^3F_3^o$ | | |
| 3298.411 | 50 | 25R | MIT | 30308.93 | $b^3F_2 - w^3D_2^o$ | | |
| 3297.955 | 50 | 6 | MIT | 30313.11 | $b^3F_4 - y^3F_3^o$ | 1.250 | 0.959 |
| 3297.258 | 50 | 4 | MIT | 30319.53 | $b^3P_1 - x^3P_1^o$ | | |
| 3296.649 | 50 | 5 | MIT | 30325.13 | $a^3P_2 - z^1F_3^o$ | | |
| 3296.111 | 50 | 10 | MIT | 30330.08 | $b^3P_2 - 204$ | | |
| 3294.110 | 60 | 200 | MIT | 30348.50 | $a^5F_5 - z^3F_4^o$ | 1.40 | 1.30 |
| 3291.659 | 12 | - | MIT | 30371.10 | $a^1G_4 - w^5D_3^o$ | | |
| 3291.117 | 20 | - | MIT | 30376.10 | $a^5D_2 - y^3F_3^o$ | | |
| 3285.910 | 4 | - | MIT | 30424.24 | $a^5D_0 - y^3P_1^o$ | | |
| 3284.932 | 30 | 5 | MIT | 30433.29 | $a^5D_3 - y^5P_2^o$ | 1.40 | 1.69 |
| 3282.607 | 2 | - | MF | 30454.85 | $a^3H_5 - w^3F_4^o$ | | |
| 3281.866 | 3 | 1 | MF | 30461.72 | $a^5D_3 - x^3F_4^o$ | | |
| 3280.47 | 3 | - | E+H | 30474.69 | $a^5F_1 - z^3D_1^o$ | | |
| 3277.567 | 30 | 12 | MIT | 30501.68 | $a^1G_4 - x^5F_3^o$ | (0.992) | 1.059 |
| 3277.345 | 3 | 1 | MF | 30503.74 | $a^5D_4 - 161$ | | |
| 3274.706 | 60 | 25 | MIT | 30528.32 | $b^3F_3 - w^3F_2^o$ | 1.087 | 0.891 |
| 3273.621 | 2 | 5 | MIT | 30538.44 | $a^3H_4 - A235$ | | |
| 3273.078 | 60 | 20 | MIT | 30543.51 | $a^5P_2 - z^3S_1^o$ | 1.56 | 1.56 n |
| 3268.208 | 60 | 12 | MIT | 30589.02 | $b^3P_2 - x^3P_2^o$ | 1.32 | 1.42 |
| 3268.106 | 3 | - | MF | 30589.98 | $a^3F_2 - y^5P_1^o$ | | |
| 3266.445 | 50 | 9 | MIT | 30605.53 | $b^3F_3 - w^3F_3^o$ | 1.090 | 1.230 |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman g_1 | Effect g_2 |
|-----------|-----|-----|-------|----------|---|-----------------|-----------------|
| 3264.663 | 30 | 6 | MIT | 30622.23 | $a^3F_3 - y^5P_3^o$ | | |
| 3264.550 | 30 | 5 | MIT | 30623.30 | $a^5F_1 - y^5D_2^o$ | | |
| 3263.853 | 30 | 3 | MIT | 30629.83 | $a^3P_1 - z^1P_1^o$ | | |
| 3263.148 | 3 | - | MF | 30636.45 | $a^3P_2 - w^3F_3^o$ | | |
| 3261.129 | 30 | 3 | MIT | 30655.42 | $b^3P_2 - x^3P_1^o$ | | |
| 3260.353 | 100 | 50 | MIT | 30662.71 | $a^5P_2 - y^5P_3^o$ or $a^5P_3 - y^3F_3^o$ | | |
| 3260.167 | 12 | - | MIT | 30664.46 | $a^1G_4 - A214$ | | |
| 3259.667 | 60 | 9 | MIT | 30669.17 | $a^5D_1 - y^3P_2^o$ | | |
| 3258.04 | 15 | 8 | MIT | 30684.48 | $a^5D_2 - y^3P_2^o$ | | |
| 3256.620 | 3 | - | MF | 30697.86 | $a^5D_3 - z^3H_4^o$ | | |
| 3256.331 | 50 | 3 | MIT | 30700.59 | $a^5D_1 - y^5P_1^o$ | 1.791 | 2.318 |
| 3254.708 | 50 | 9 | MIT | 30715.89 | $a^5D_2 - y^5P_1^o$ | 1.229 | 2.312 |
| 3254.542 | 50 | 9 | MIT | 30717.46 | $a^5F_2 - y^5D_3^o$ | 1.001 | 1.495 |
| 3252.905 | 20 | - | MIT | 30732.92 | $a^3F_2 - y^3P_1^o$ | | |
| 3252.539 | 12 | - | MIT | 30736.37 | $a^3D_2 - w^5D_2^o$ | | |
| 3251.890 | 30 | 3 | MIT | 30742.51 | $a^3G_3 - x^3G_3^o$ | 0.76 | 0.76 n |
| 3251.329 | 30 | 3 | MIT | 30747.81 | $a^3P_1 - x^3F_2^o$ | | |
| 3250.465 | 5 | - | MF | 30755.99 | $a^3D_3 - 231$ | | |
| 3250.009 | 30 | 3 | MIT | 30760.30 | $a^5D_4 - y^3F_4^o$ | (1.447) | 1.108p |
| 3248.843 | 5 | - | MIT | 30771.34 | $a^3G_5 - z^3I_5^o$ or $a^3H_4 - A237$ | | |
| 3246.273 | 2 | - | MF | 30795.70 | $b^3P_2 - x^3G_3^o$ | | |
| 3244.456 | 6 | - | MIT | 30812.97 | $a^5P_1 - y^3F_2^o$ | | |
| 3244.341 | 5 | - | MIT | 30814.04 | $a^5D_4 - z^3H_5^o$ | | |
| 3243.498 | 70 | 12 | MIT | 30822.05 | $a^3F_4 - y^3D_3^o$ | 1.280 | 1.375 |
| 3242.848 | 20 | - | MIT | 30828.23 | $b^3F_3 - x^3F_3^o$ or $a^1G_4 - 216$ | | |
| 3242.165 | 80 | - | MIT | 30834.72 | $a^3P_1 - z^1S_0^o$ | 1.684 | 0/0 n |
| 3241.235 | 60 | 12 | MIT | 30843.57 | $a^5D_1 - y^3P_1^o$ | 1.792 | 1.605 |
| 3239.929 | 3 | - | MF | 30856.00 | $a^3D_3 - A231$ | | |
| 3239.695 | 25 | 1h | MF | 30858.23 | $a^5D_3 - y^3F_3^o$ | | |
| 3239.605 | 50 | 5 | MIT | 30859.09 | $a^3P_2 - x^3F_3^o$ | 1.541 | 1.285 |
| 3238.775 | 50 | 1 | MIT | 30866.99 | $a^5F_2 - z^3D_1^o$ | | |

| λ | Arc | Sok | Auth. | σ | Comb. | Zeeman g_1 | Effect g_2 |
|-----------|-----|-----|-------|----------|---------------------|-----------------|-----------------|
| 3238.527 | 100 | 45 | MIT | 30869.36 | $a^3D_2 - u^3D_2^o$ | 1.167 | 1.095up |
| 3233.522 | 4 | - | MF | 30917.14 | $a^3H_5 - B231$ | | |
| 3232.751 | 50 | 4 | MIT | 30924.51 | $a^3F_3 - y^5P_2^o$ | 1.196 | 1.715 |
| 3232.594 | 2 | - | MF | 30926.01 | $a^3G_4 - y^5G_5^o$ | | |
| 3230.617 | 3 | 1 | MF | 30944.89 | $a^3H_6 - A226$ | | |
| 3229.760 | 4 | 1 | MF | 30953.09 | $a^3F_3 - x^3F_4^o$ | | |
| 3228.760 | 4 | - | MF | 30962.74 | $a^3G_3 - w^3G_4^o$ | | |
| 3228.530 | 50 | 150 | MIT | 30964.94 | $a^5P_2 - y^5P_2^o$ | | |
| 3228.157 | 12 | 4 | MIT | 30968.52 | $b^3F_2 - z^1P_1^o$ | | |
| 3227.885 | 20 | 10 | MIT | 30971.13 | $a^5P_3 - y^3P_2^o$ | 1.626 | 1.298 |
| 3226.374 | 50 | 12 | MIT | 30985.63 | $a^5F_1 - y^5D_1^o$ | 0.000 | 1.515 |
| 3224.651 | 4 | - | MIT | 31002.19 | $a^3D_2 - u^3D_1^o$ | | |
| 3223.274 | 60 | 35 | MIT | 31015.43 | $a^5F_2 - y^5D_2^o$ | 0.998 | 1.478 |
| 3220.77 | 2 | - | K | 3Lo39.55 | $z^3F_4^o - 63$ | | |
| 3220.069 | 4 | 3 | MIT | 31046.30 | $a^3G_4 - y^5G_4^o$ | | |
| 3219.129 | tr | - | MF | 31055.37 | $a^1G_4 - w^3G_5^o$ | | |
| 3217.503 | tr | - | MF | 31071.06 | $a^3D_3 - 233$ | | |
| 3216.523 | 12 | 6 | MIT | 31080.56 | $a^5F_3 - z^3F_2^o$ | | |
| 3215.897 | 4 | 2 | MF | 31086.57 | $b^3F_2 - x^3F_2^o$ | | |
| 3214.322 | 3 | - | MF | 31101.64 | $b^3F_3 - w^3D_2^o$ | | |
| | | | | or | $a^3G_3 - y^5G_3^o$ | | |
| 3212.969 | 10 | 6 | MIT | 31114.90 | $b^3F_4 - y^3G_3^o$ | 1.256 | 0.886 |
| 3212.038 | 4 | 0 | MF | 31123.92 | $a^3G_3 - 211$ | | |
| 3211.130 | tr | - | MF | 31132.72 | $a^3P_2 - w^3D_2^o$ | | |
| 3210.17 | 2 | - | E+H | 31142.03 | $a^3P_0 - w^3D_1^o$ | | |
| 3208.74 | 1 | - | S | 31155.95 | $b^3F_4 - z^1G_4^o$ | | |
| 3208.41 | 3 | - | S | 31159.15 | $a^3G_4 - 204$ | | |
| 3207.751 | 0 | - | M | 31166.51 | $a^5D_3 - y^3P_2^o$ | | |
| 3206.473 | tr | - | MF | 31177.94 | $a^5D_2 - y^3G_3^o$ | | |
| 3205.312 | 4 | 1 | MIT | 31189.23 | $a^3F_3 - z^3H_4^o$ | | |
| 3204.060 | 8 | 5 | MIT | 31201.42 | $a^5F_4 - z^3F_3^o$ | | |
| 3201.499 | 4 | 5 | MIT | 31226.37 | $b^3F_3 - w^3D_3^o$ | | |
| 3201.258 | 2 | 100 | MIT | 31228.73 | $b^3P_0 - u^3D_1^o$ | | |
| 3199.108 | 2 | - | MF | 31249.71 | $a^3F_2 - y^3F_2^o$ | | |
| 3198.327 | 3 | - | MIT | 31257.34 | $a^3P_2 - w^3D_3^o$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman g_1 | Effect g_2 |
|-----------|-----|-----|-------|----------|-------------------|-----------------|-----------------|
| 3196.591 | 50 | 2 | MIT | 31274.32 | $a^5F_1 - y^5D_0$ | 0.00 | 0/0 n |
| 3194.738 | 4 | 1 | MIT | 31292.31 | $a^3G_4 - y^1H_5$ | 1.03 | 1.03 n |
| 3193.397 | 4 | - | MF | 31304.51 | $a^1H_5 - 245$ | (1.007) | 1.094p |
| 3193.149 | 2 | - | MF | 31308.03 | $a^3H_4 - 241$ | | |
| 3192.069 | 10 | 5 | MIT | 31318.62 | $b^3F_4 - y^3G_4$ | 1.253 | 1.196up |
| 3191.776 | 3 | 1 | MIT | 31321.49 | $a^3P_1 - y^3S_1$ | | |
| 3189.976 | 50 | 50 | MIT | 31339.17 | $a^5F_3 - y^5D_3$ | 1.251 | 1.498 |
| 3189.296 | 3 | - | MIT | 31345.85 | $a^5F_5 - z^5G_4$ | | |
| 3188.907 | 4 | 3 | MIT | 31349.59 | $a^3F_3 - y^3F_3$ | | |
| 3188.609 | 3 | 5 | MIT | 31352.60 | $b^3F_3 - x^3D_2$ | | |
| 3188.338 | 60 | 50 | MIT | 31355.27 | $a^5F_3 - y^5D_4$ | | |
| 3187.932 | 4 | - | MF | 31359.17 | $a^5F_2 - z^5P_3$ | | |
| 3187.813 | tr | - | MF | 31360.43 | $a^5D_1 - y^3F_2$ | | |
| 3186.594 | 3 | - | MF | 31372.43 | $a^3G_3 - w^5D_3$ | | |
| 3186.044 | 80 | 25 | MIT | 31377.84 | $a^5F_2 - y^5D_1$ | 0.998 | 1.515 |
| 3185.442 | 12 | - | MIT | 31383.77 | $a^3P_2 - x^3D_2$ | | |
| 3183.147 | 3 | - | MF | 31406.40 | $a^3H_4 - B241$ | | |
| 3181.187 | 4 | - | MIT | 31425.75 | $b^3P_2 - w^5D_3$ | | |
| 3179.264 | 50 | 50R | MIT | 31444.76 | $a^3D_3 - A235$ | 1.325 | 1.055 |
| 3179.031 | 3 | - | MF | 31447.06 | $b^3F_2 - w^3D_1$ | | |
| | | | | or | $a^1D_2 - A241$ | (1.175) | 1.143n |
| 3176.292 | 50 | 3 | MIT | 31474.18 | $a^3D_2 - 227$ | | |
| 3174.131 | 50 | 3 | MIT | 31495.61 | $b^3F_4 - z^1H_5$ | 1.251 | 1.020 |
| 3173.399 | 30 | - | MIT | 31502.87 | $a^3G_3 - x^5F_3$ | | |
| 3173.110 | 30 | - | MIT | 31505.74 | $a^5P_3 - z^1G_4$ | | |
| 3171.239 | 20 | - | MIT | 31524.28 | $a^5D_0 - x^3D_1$ | 0/0 | 0.886n |
| 3170.093 | 30 | - | MIT | 31535.72 | $a^3G_5 - y^5G_5$ | (1.190) | 1.272p |
| 3168.525 | 100 | 25R | MIT | 31551.33 | $b^3F_2 - y^1F_3$ | 0.757 | 0.994 |
| 3168.239 | 40 | - | MIT | 31554.17 | $a^5D_4 - x^3F_4$ | | |
| 3167.816 | 12 | - | MF | 31558.39 | $a^1D_2 - C242$ | | |
| 3167.378 | 3 | - | MIT | 31562.75 | $a^5P_1 - w^3F_2$ | | |
| 3166.356 | tr | - | MF | 31572.94 | $a^1G_4 - 225$ | | |
| 3165.194 | 15 | - | MF | 31584.53 | $a^3F_2 - x^3D_3$ | | |
| 3163.828 | 10 | - | MIT | 31598.16 | $a^3D_3 - B235$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman g_1 | Effect g_2 |
|-----------|-----|-----|-------|----------|---|-----------------|-----------------|
| 3160.940 | 2 | - | MF | 31627.03 | $a^3D_3 - 237$ | | |
| 3159.923 | 70 | 25 | MIT | 31637.21 | $a^5F_3 - y^5D_2^o$ | 1.250 | 1.481 |
| 3158.889 | 60 | 12 | MIT | 31647.57 | $b^3F_4 - x^3D_3^o$ | 1.258 | 1.170 |
| 3158.060 | 2 | - | MF | 31655.87 | $a^3G_5 - y^5G_4^o$ | | |
| 3157.846 | 40 | - | MF | 31658.02 | $a^3F_3 - y^3P_2^o$ | | |
| 3157.627 | 30 | - | MIT | 31660.22 | $b^3F_2 - y^3S_1^o$ | | |
| 3157.419 | 30 | 1 | MIT | 31662.30 | $a^5P_3 - y^3F_2^o$ | | |
| 3157.081 | 60 | - | MF | 31665.69 | $a^3G_3 - A214$ | | |
| 3156.817 | 50 | - | MIT | 31668.34 | $a^5P_3 - y^3G_4^o$ | | |
| 3155.881 | 3 | - | MF | 31667.73 | $a^3D_3 - A237$ | | |
| 3154.434 | 30 | - | MIT | 31692.26 | $b^3F_3 - w^3F_4^o$ or $a^3D_2 - w^3F_3^o$ | | |
| 3153.823 | 60 | 12 | MIT | 31698.40 | $a^5P_2 - y^3P_2^o$ or $a^3F_4 - y^3F_4^o$ | 1.561 | 1.309 |
| 3153.595 | 2 | - | MF | 31700.69 | $b^3P_0 - 227$ | | |
| 3152.608 | tr | - | MF | 31710.62 | $a^5D_2 - x^3D_3^o$ | | |
| 3153.353 | 100 | 6 | MIT | 31723.25 | $a^3P_1 - v^3D_2^o$ or $a^1D_2 - A242$ | | |
| 3150.693 | 60 | 60 | MIT | 31729.85 | $a^5P_2 - y^5P_1^o$ | | |
| 3148.485 | 30 | - | MIT | 31752.14 | $a^3F_4 - z^3H_5^o$ | | |
| 3147.208 | 50 | 3 | MIT | 31765.02 | $a^3F_2 - z^1F_3^o$ | | |
| 3146.067 | 30 | 20 | MIT | 31776.55 | $a^5F_1 - z^5P_2^o?$ | | |
| 3144.720 | 4 | - | MIT | 31790.16 | $a^5D_4 - z^3H_4^o$ | | |
| 3144.649 | 3 | - | MF | 31790.87 | $a^3G_4 - x^5F_4^o$ | | |
| 3144.508 | 4 | - | MF | 31792.30 | $a^3P_2 - z^1P_1^o$ | | |
| 3144.260 | 60 | 8 | MIT | 31794.81 | $a^1G_4 - A226$ | (0.992) | 1.022n |
| 3142.891 | 3 | - | MF | 31808.65 | $b^3P_1 - w^5D_2^o$ | | |
| 3142.533 | 7 | - | MF | 31812.28 | $a^3D_3 - 238$ | | |
| 3140.973 | 60 | 6 | MIT | 31828.08 | $b^3F_4 - z^1F_3^o$ | 1.263 | 1.142 |
| 3140.484 | 50 | - | MIT | 31833.03 | $a^3F_2 - x^3D_1^o$ | 1.094 | 0.898 |
| 3140.084 | 8 | - | MIT | 31837.09 | $a^3H_4 - A243$ | | |
| 3139.272 | 20 | - | MIT | 31845.32 | $a^3G_4 - w^3G_4^o$ | | |
| 3138.760 | 10 | - | MIT | 31850.52 | $a^3G_3 - w^3G_3^o$ | | |
| 3136.909 | 6 | - | MIT | 31869.31 | $a^3H_5 - 239$ | | |
| 3136.555 | 60 | 6 | MIT | 31872.90 | $a^5P_2 - y^3P_1^o$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman Effect | |
|-----------|-----|-----|-------|----------|----------------------|---------------|-------|
| | | | | | | g_1 | g_2 |
| 3135.924 | 12 | - | MIT | 31879.32 | $b^3F_3 - x^3F_2^o$ | | |
| 3135.078 | 2 | - | MF | 31887.92 | $a^1D_2 - A243$ | | |
| 3134.631 | tr | - | MF | 31892.47 | $a^3D_2 - 231$ | | |
| 3133.697 | 12 | - | MIT | 31901.97 | $a^3G_5 - y^1H_5^o$ | | |
| 3132.878 | 60 | 5 | MIT | 31910.31 | $a^3P_2 - x^3F_2^o$ | 1.550 | 1.029 |
| 3129.837 | 60 | 4 | MIT | 31941.32 | $a^5F_1 - z^5P_1^o$ | 0:000 | 2.383 |
| 3129.604 | 50 | 1 | MIT | 31943.70 | $a^5D_1 - x^3D_1^o$ | | |
| 3128.939 | 2 | - | MF | 31950.48 | $a^5D_4 - y^3F_3^o$ | | |
| 3128.106 | 3 | - | MF | 31958.99 | $a^5D_2 - x^3D_1^o$ | | |
| 3127.266 | 3 | - | MF | 31967.57 | $a^5D_4 - y^3G_5^o$ | | |
| 3126.608 | 12 | 50 | MIT | 31974.30 | $a^3D_3 - 240$ | | |
| 3125.963 | 70 | 12 | MIT | 31980.90 | $a^5F_3 - z^5P_3^o$ | 1.248 | 1.647 |
| 3124.607 | 50 | 2 | MIT | 31994.78 | $a^1G_4 - w^3F_4^o?$ | | |
| 3124.366 | 30 | 2 | MIT | 31997.25 | $a^5P_3 - x^3D_3^o$ | | |
| 3124.167 | 60 | 8 | MIT | 31999.31 | $a^3F_2 - w^3F_2^o$ | | |
| 3123.509 | 4 | - | MF | 32006.03 | $a^3G_4 - 211$ | | |
| 3120.543 | 10 | - | MIT | 32036.44 | $a^3G_5 - w^5D_4^o$ | | |
| 3118.685 | 50 | 3 | MIT | 32055.53 | $a^3P_1 - v^3D_1^o$ | | |
| 3118.071 | 50 | 50 | MIT | 32061.84 | $b^3F_2 - v^3D_2^o$ | 0.72 | 1.16 |
| 3117.623 | 5 | - | MF | 32066.45 | $a^3D_1 - 243$ | | |
| 3117.464 | 3 | - | MF | 32068.09 | $a^3H_4 - C243$ | | |
| 3116.839 | 30 | - | MIT | 32074.52 | $b^3P_1 - u^3D_1^o$ | | |
| 3116.658 | 30 | - | MIT | 32076.38 | $a^3F_2 - w^3F_3^o$ | | |
| 3115.452 | 3 | - | MIT | 32088.79 | $a^3P_0 - v^3D_1^o$ | | |
| 3113.397 | 50 | - | MIT | 32109.97 | $a^5D_1 - w^3F_2^o$ | | |
| 3112.677 | 50 | 3 | MIT | 32117.40 | $a^3P_1 - z^1D_2^o$ | | |
| | | | | or | $a^3F_2 - 186$ | | |
| 3112.304 | 30 | - | MIT | 32121.25 | $b^3P_1 - w^5D_0^o$ | | |
| 3111.912 | 50 | 5 | MIT | 32125.30 | $a^5D_2 - w^3F_2^o$ | 1.232 | 0.892 |
| 3110.549 | 60 | 6 | MIT | 32139.37 | $b^3F_4 - w^3F_3^o$ | | |
| 3110.042 | 4 | - | MF | 32144.61 | $b^3P_2 - w^5D_2^o$ | | |
| 3109.403 | 20 | - | MIT | 32151.22 | $a^3F_3 - y^3G_3^o$ | | |
| 3108.426 | 30 | - | MIT | 32161.32 | $a^3F_4 - y^5P_3^o$ | | |
| 3107.715 | 60 | 5 | MIT | 32168.68 | $a^5P_2 - z^5P_2^o$ | | |
| 3106.840 | 50 | 3 | MIT | 32177.74 | $a^5P_3 - z^1F_3^o$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman g_1 | Effect g_2 |
|-----------|-----|-----|-------|----------|-------------------|-----------------|-----------------|
| 3105.496 | 2 | - | MF | 32191.67 | $a^5P_2 - y^3G_0$ | | |
| 3105.411 | 50 | 1 | MIT | 32192.55 | $a^3F_3 - z^1G_4$ | | |
| | | | | or | $a^5D_3 - x^5D_0$ | | |
| 3105.283 | 50 | 40 | MIT | 32193.87 | $a^3D_2 - w^3F_2$ | 1.164 | 0.702 |
| 3104.464 | 30 | - | MIT | 32202.37 | $a^5D_2 - w^3F_3$ | | |
| 3103.748 | 2 | - | MF | 32209.79 | $b^3P_1 - w^5D_1$ | | |
| 3100.839 | 70 | 50 | MIT | 32240.01 | $a^5F_4 - y^5D_3$ | 1.350 | 1.508 |
| 3100.249 | 2 | - | MF | 32246.15 | $a^1G_4 - 231$ | | |
| 3099.283 | 70 | 60 | MIT | 32256.19 | $a^5F_4 - y^5D_4$ | | |
| 3098.605 | 3 | 0 | MF | 32263.25 | $a^3H_5 - B241$ | | |
| 3097.879 | 6 | 15 | MIT | 32270.81 | $a^3P_2 - w^3D_1$ | | |
| 3097.231 | 30 | - | MIT | 32277.57 | $b^3P_2 - u^3D_2$ | | |
| 3096.568 | 70 | 60 | MIT | 32284.47 | $a^3G_5 - C208$ | (1.190) | 1.164n |
| 3091.873 | 50 | 5 | MIT | 32333.50 | $a^5F_2 - z^5P_1$ | 1.001 | 2.388 |
| 3090.897 | 30 | 1 | MIT | 32343.71 | $b^3F_3 - y^1F_3$ | | |
| 3090.379 | 12 | 1h | MF | 32349.13 | $a^3F_3 - y^3F_2$ | | |
| 3089.801 | 60 | 5 | MIT | 32355.18 | $a^3F_3 - y^3G_4$ | 1.19 | 1.19 n |
| 3089.145 | 60 | 12 | MIT | 32362.05 | $b^3F_4 - x^3F_3$ | | |
| 3088.075 | 30 | 2wh | MIT | 32373.26 | $a^5D_3 - z^1F_3$ | | |
| 3087.917 | 4 | - | MIT | 32374.92 | $a^3P_2 - y^1F_3$ | | |
| 3086.930 | 30 | 1 | MIT | 32385.27 | $a^3G_4 - x^5F_3$ | | |
| 3086.784 | 8 | - | MIT | 32386.80 | $a^5P_1 - x^3D_2$ | | |
| 3086.520 | 30 | 40 | MIT | 32389.57 | $a^5P_2 - y^3F_2$ | | |
| 3086.067 | 60 | 6 | MIT | 32394.33 | $b^3F_2 - v^3D_1$ | | |
| 3085.469 | 4 | - | MIT | 32400.60 | $a^3G_5 - x^5F_4$ | | |
| 3084.881 | 5 | - | MF | 32406.78 | $a^3D_3 - B242$ | | |
| 3084.629 | 3 | - | MF | 32409.43 | $a^1D_2 - F243$ | | |
| 3084.526 | 30 | 2 | MIT | 32410.51 | $b^3P_2 - u^3D_1$ | 1.315 | 1.116 |
| 3083.148 | 50 | 3 | MIT | 32425.00 | $a^5D_2 - x^3F_3$ | | |
| 3080.900 | 50 | 6 | MIT | 32448.65 | $a^3P_1 - x^3P_2$ | | |
| 3080.193 | 30 | - | MIT | 32456.10 | $b^3F_2 - z^1D_2$ | 0.75 | 1.01 |
| 3078.693 | 2 | - | MF | 32471.91 | $a^3D_2 - C235$ | | |
| 3077.552 | 30 | 1 | MIT | 32483.95 | $a^3P_2 - y^3S_1$ | (1.534) | 1.528n |
| 3077.063 | 30 | 40 | MIT | 32489.11 | $a^5P_3 - w^3F_3$ | | |
| 3076.777 | 50 | 3 | MIT | 32492.13 | $a^3F_4 - x^3F_4$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman Effect | |
|-----------|-----|-----|-------|----------|----------------------|---------------|---------|
| | | | | | | g_1 | g_2 |
| 3076.669 | 3 | - | MF | 32493.28 | $a^3D_2 - D235$ | | |
| 3073.336 | 50 | 5 | MIT | 32528.51 | $b^3F_2 - 204$ | | |
| 3071.735 | tr | - | MF | 32545.46 | $b^3P_2 - w^5D_1^o?$ | | |
| 3071.642 | 3 | - | MF | 32546.45 | $b^3P_1 - 227$ | | |
| 3071.499 | 20 | - | MIT | 32547.96 | $a^3G_4 - A214$ | | |
| 3069.184 | 30 | 1 | MIT | 32572.51 | $a^3F_2 - w^3D_2^o$ | | |
| 3069.043 | 2 | - | MF | 32574.01 | $a^3G_3 - 225$ | | |
| 3067.679 | 3 | - | MF | 32588.49 | $a^3D_3 - 243$ | | |
| 3065.897 | 4 | - | MF | 32607.37 | $a^5D_3 - w^3F_2^o$ | | |
| 3064.838 | 70 | 60 | MIT | 32618.70 | $b^3F_4 - x^3G_5^o$ | (1.255) | 1.205n |
| 3062.932 | 2 | - | MF | 32639.00 | $a^1G_4 - 234$ | | |
| 3061.043 | tr | - | MF | 32659.14 | $a^3G_4 - u^3D_3^o$ | | |
| 3058.786 | 30 | 3 | MIT | 32683.23 | $a^5D_1 - w^3D_2^o$ | | |
| 3058.655 | 30 | 3 | MIT | 32684.64 | $a^5D_3 - w^3F_3^o$ | | |
| 3057.342 | 30 | 2 | MIT | 32698.67 | $a^5D_2 - w^3D_2^o$ | 1.239 | 1.192up |
| 3056.136 | 20 | - | MF | 32711.57 | $a^5P_3 - x^3F_3^o$ | | |
| 3054.937 | 70 | 12 | MIT | 32724.41 | $a^5P_2 - x^3D_3^o$ | 1.559 | 1.157 |
| 3054.580 | 2 | - | MF | 32728.24 | $a^3F_4 - z^3H_4^o$ | | |
| 3052.342 | 8 | - | MIT | 32752.23 | $a^5D_4 - y^3G_3^o$ | | |
| 3052.089 | 3 | - | MF | 32755.06 | $a^3G_3 - 236$ | | |
| 3051.597 | 30 | - | MIT | 32760.23 | $b^3F_4 - w^3D_3^o$ | | |
| 3049.075 | 6 | - | MIT | 32787.33 | $b^3F_2 - x^3P_2^o$ | | |
| 3048.785 | 60 | 9 | MIT | 32790.44 | $a^5F_3 - z^5P_2^o$ | 1.248 | 1.810 |
| 3048.495 | 50 | 5 | MIT | 32793.56 | $a^5D_4 - z^1G_4^o$ | | |
| 3048.314 | 7 | - | MF | 32795.51 | $a^5P_1 - z^1P_1^o$ | | |
| 3046.562 | tr | - | MF | 32814.37 | $a^3D_2 - A237$ | | |
| 3045.869 | 2 | - | MF | 32821.83 | $b^3P_1 - 230$ | | |
| 3045.710 | 60 | 12 | MIT | 32823.55 | $a^3F_2 - x^3D_2^o$ | 1.083 | 1.006 |
| 3045.515 | 3 | - | MF | 32825.65 | $a^1G_4 - C235$ | | |
| 3043.060 | 40 | 0 | MF | 32852.13 | $a^3H_4 - 244$ | | |
| 3042.831 | 60 | 5 | MIT | 32854.60 | $b^3F_3 - v^3D_2^o$ | | |
| 3042.475 | 70 | 12 | MIT | 32858.45 | $a^5F_1 - y^5F_2^o$ | 0.000 | 1.070 |
| 3041.919 | 30 | 1 | MIT | 32864.45 | $a^3F_3 - z^1F_3^o$ | | |
| 3040.310 | 60 | 10 | MIT | 32881.84 | $a^5F_4 - z^5P_3^o$ | 1.347 | 1.648 |
| 3039.961 | 30 | 2 | MIT | 32885.62 | $a^3P_2 - v^3D_2^o$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman g_1 | Effect g_2 |
|-----------|-----|-----|-------|----------|---|-----------------|-----------------|
| 3039.684 | 12 | - | MIT | 32881.64 | $a^3F_4 - y^3F_3^o$ | | |
| 3038.176 | 80 | 5 | MIT | 32904.94 | $a^5P_2 - z^1F_3^o$ | 1.58 | 1.14 |
| 3037.964 | 50 | 5 | MIT | 32907.23 | $a^5D_3 - x^3F_3^o$ | | |
| 3036.466 | 50 | 150 | MIT | 32923.47 | $a^5D_0 - z^1P_1^o$ | | |
| 3036.349 | 2 | - | MF | 32924.74 | $a^3H_5 - C243$ or $a^1D_2 - E244$ | | |
| 3035.473 | 60 | 4 | MIT | 32934.24 | $a^5D_1 - x^3D_2^o$ | | |
| 3034.060 | 60 | 5 | MIT | 32949.58 | $a^5D_2 - x^3D_2^o$ | 1.233 | 1.005 |
| 3033.451 | 70 | 10 | MIT | 32956.19 | $a^5D_4 - y^3G_4^o$ | 1.448 | 1.197 |
| 3031.914 | 30 | - | MIT | 32972.90 | $a^5P_2 - x^3D_1^o$ | | |
| 3031.792 | 2 | - | MF | 32974.22 | $a^3D_3 - C243$ | | |
| 3031.122 | 20 | - | MF | 32981.52 | $b^3P_0 - 236$ | | |
| 3030.781 | 30 | 2 | MIT | 32985.22 | $a^5P_3 - w^3D_2^o$ | 1.633 | 1.190 |
| 3029.961 | 2 | - | MF | 32994.15 | $b^3F_2 - x^3G_3^o$ | | |
| 3029.385 | 10 | - | MF | 33000.42 | $a^5P_1 - z^1S_0^o$ | | |
| 3027.084 | 20 | - | MIT | 33025.51 | $a^3H_4 - B244$ | | |
| 3025.099 | 8 | - | MIT | 33047.17 | $a^3G_3 - w^3F_3^o$ | | |
| 3020.882 | 60 | 40 | MIT | 33093.30 | $a^5F_2 - y^5F_3^o$ | 1.001 | 1.275 |
| 3020.241 | 4 | - | MF | 33100.33 | $b^3P_2 - w^3F_3^o$ | | |
| 3019.371 | 20 | - | MIT | 33109.87 | $a^5P_3 - w^3D_3^o$ | | |
| 3019.303 | 25 | - | MF | 33110.61 | $a^3D_2 - 240$ | | |
| 3017.236 | 100 | 50 | MIT | 33133.29 | $a^5F_1 - y^5F_1^o$ or $a^5D_4 - z^1H_5^o$ | 0.000 | 0.143 |
| 3016.697 | 4 | - | MIT | 33139.21 | $a^5P_2 - w^3F_2^o$ | | |
| 3015.026 | 3 | - | MF | 33157.58 | $a^3G_5 - A214$ | | |
| 3014.088 | 5 | - | MF | 33167.90 | $a^1G_4 - A237$ | | |
| 3013.359 | 60 | 5 | MIT | 33175.92 | $a^3F_3 - w^3F_3^o$ | 1.198 | 1.232 |
| 3012.916 | 60 | 4 | MIT | 33180.80 | $a^5D_3 - w^3D_2^o$ | 1.418 | 1.181 |
| 3010.42 | - | 1 | E+H | 33208.31 | $b^3F_3 - y^5G_4^o$ | | |
| 3009.694 | 20 | - | MIT | 33216.32 | $a^5P_2 - w^3F_3^o$ | | |
| 3008.796 | 50 | 5 | MIT | 33226.23 | $b^3F_4 - w^3F_4^o$ | 1.25 | 1.25 n |
| 3008.259 | 50 | 3 | MIT | 33232.16 | $a^3F_2 - z^1P_1^o$ | 1.094 | 0.965 |
| 3007.872 | 6 | - | MF | 33236.34 | $a^5P_3 - x^3D_2^o$ | | |
| 3006.590 | 70 | 15 | MIT | 33250.61 | $a^3G_4 - 222$ or $a^5F_2 - y^5F_2^o$ | 1.001 | 1.068 |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman Effect | |
|-----------|-----|------|-------|----------|----------------------|---------------|----------|
| | | | | | | g_1 | g_2 |
| 3005.973 | 12 | - | MIT | 33257.43 | $a^5P_2 - 186$ | | |
| 3004.471 | 5 | - | MF | 33274.06 | $a^5P_1 - w^3D_1^0$ | | |
| 3003.961 | 12 | - | MF | 33279.71 | $a^5P_2 - z^1D_2^0$ | | |
| 3003.485 | 30 | - | MIT | 33284.98 | $a^5D_4 - x^3D_3^0$ | | |
| 3002.067 | 6 | - | MIT | 33300.70 | $b^3P_2 - 231$ | | |
| 3001.642 | 60 | 5 | MIT | 33305.41 | $a^5D_3 - w^3D_3^0$ | | |
| 3000.227 | 30 | 1 | MIT | 33321.13 | $b^3F_3 - 204$ | | |
| 2997.615 | 30 | 5 | MIT | 33350.16 | $a^3F_2 - x^3F_2^0$ | | |
| 2997.426 | 30 | 5 | MIT | 33352.26 | $a^3P_2 - 204$ | | |
| 2997.318 | 12 | 0 | MF | 33353.46 | $b^3F_2 - y^5G_3^0$ | | |
| 2996.895 | 60 | 5 | MIT | 33358.17 | $a^5D_2 - z^1P_1^0$ | | |
| 2994.964 | 80 | 40 | MIT | 33379.68 | $a^5F_3 - y^5F_4^0$ | 1.24 | 1.35 |
| 2993.272 | 60 | 9 | MIT | 33398.55 | $a^3F_3 - x^3F_3^0$ | 1.218 | 1.298sup |
| 2992.957 | 12 | 1 | MIT | 33402.06 | $a^5D_0 - w^3D_1^0$ | | |
| 2990.291 | 30 | 1 | MIT | 33431.84 | $a^5D_3 - w^3D_3^0$ | | |
| 2989.655 | 30 | 2 | MIT | 33438.95 | $a^5P_2 - x^3F_3^0$ | | |
| | | | | or | $a^3D_2 - A241$ | | |
| 2988.948 | 250 | 100 | MIT | 33446.86 | $a^5F_5 - y^5D_4^0$ | 1.39 | 1.52 |
| 2988.094 | 8 | - | MIT | 33456.42 | $a^3G_4 - 225$ | | |
| 2987.932 | 10 | - | MF | 33458.23 | $a^3G_3 - B231$ | | |
| 2987.705 | 30 | - | MIT | 33460.77 | $a^5D_1 - x^3F_2^0$ | 1.798 | 1.028 |
| 2986.335 | 20 | 25wh | MIT | 33476.12 | $a^5D_2 - x^3F_2^0$ | 1.23 | 1.03 |
| 2981.935 | 60 | 3 | MIT | 33525.52 | $a^5F_2 - y^5F_1^0$ | 0.992 | 0.139 |
| 2979.959 | 60 | 80 | MIT | 33547.75 | $a^5D_1 - z^1S_0^0?$ | | |
| 2979.874 | 4 | - | MF | 33548.70 | $a^3G_5 - w^3G_5^0$ | | |
| | | | | or | $a^3G_3 - w^3F_2^0$ | | |
| 2979.72 | 30 | 40 | MIT | 33550.44 | $a^3D_2 - C242$ | | |
| 2978.380 | 6 | - | MIT | 33565.53 | $b^3P_1 - D235$ | | |
| 2977.100 | 5 | - | MF | 33579.96 | $b^3F_3 - x^3P_2^0$ | | |
| 2976.925 | 60 | 5 | MIT | 33581.93 | $a^5F_4 - y^5F_5^0$ | | |
| 2975.133 | 2 | - | MF | 33602.16 | $b^3P_2 - w^3F_2^0$ | | |
| 2974.335 | 30 | 2 | MIT | 33611.18 | $a^3P_2 - x^3P_2^0$ | | |
| 2973.991 | 50 | 5 | MIT | 33615.06 | $a^5D_0 - y^3S_1^0$ | | |
| 2972.998 | 15 | - | MF | 33626.29 | $a^3D_1 - G244$ | | |
| 2971.771 | 10 | 15 | MIT | 33640.18 | $a^3G_3 - 234$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman Effect | |
|-----------|-----|-----|-------|----------|------------------------|---------------|---------|
| | | | | | | g_1 | g_2 |
| 2971.265 | 2 | - | MF | 33645.89 | a^3G_3 - 235 | | |
| 2968.954 | 60 | 6 | MIT | 33672.09 | a^3F_3 - $w^3D_2^o$ | 1.21 | 1.21 n |
| 2968.482 | 15 | - | MIT | 33677.45 | a^3P_2 - $x^3P_1^o$ | 1.537 | 1.364 |
| 2968.402 | 60 | 1 | MF | 33678.35 | a^3G_4 - A226 | | |
| 2967.341 | 30 | 1 | MIT | 33690.39 | a^3F_4 - $y^3G_3^o$ | | |
| 2967.056 | 15 | - | MF | 33693.63 | b^3P_2 - 234 | | |
| 2966.559 | 12 | - | MIT | 33699.28 | b^3P_2 - 235 | | |
| 2965.711 | 20 | - | MIT | 33708.91 | a^3H_5 - 244 | | |
| 2965.546 | 60 | 200 | MIT | 33710.78 | a^3F_2 - $w^3D_1^o?$ | | |
| 2965.162 | 80 | 20 | MIT | 33715.15 | a^5F_3 - $y^5F_3^o$ | | |
| 2964.309 | 8 | - | MIT | 33724.85 | a^3D_2 - 243 | | |
| 2963.715 | 60 | 5 | MIT | 33731.61 | a^3F_4 - $z^1G_4^o$ | | |
| 2961.689 | 60 | 3 | MIT | 33754.68 | b^3F_2 - $x^5F_3^o$ | | |
| 2960.975 | 30 | 1h | MIT | 33762.82 | a^5P_3 - $x^3F_2^o$ | | |
| 2959.736 | 12 | 2h | MIT | 33776.96 | a^5D_4 - $w^3F_3^o$ | 1.444 | 1.233 |
| 2958.877 | 6 | - | MF | 33786.76 | b^3F_3 - $x^3G_3^o$ | | |
| 2958.000 | 60 | 5 | MIT | 33796.78 | a^3F_3 - $w^3D_3^o$ | 1.191 | 1.167up |
| 2956.152 | 5 | - | MIT | 33817.90 | a^3P_2 - $x^3G_3^o$ | | |
| | | | | or | a^5D_4 - 186 | | |
| 2955.842 | 15 | - | MIT | 33821.45 | a^5D_1 - $w^3D_1^o$ | | |
| 2955.359 | 50 | 1 | MIT | 33826.98 | a^3G_3 - C235 | (0.757) | 1.163p |
| 2954.486 | 100 | 20 | MIT | 33836.98 | a^5P_2 - $w^3D_3^o$ | 1.558 | 1.160 |
| | | | | or | a^5D_2 - $w^3D_3^o$ | | |
| 2952.692 | - | 100 | MIT | 33857.53 | b^3F_4 - $z^3I_5^o?$ | | |
| 2952.498 | 60 | 2 | MIT | 33859.76 | a^5F_1 - $y^3D_2^o$ | | |
| 2951.406 | 2 | - | MF | 33872.29 | a^5F_3 - $y^5F_2^o$ | | |
| 2950.715 | 5 | - | MF | 33880.22 | b^3P_2 - C235 | | |
| 2950.536 | 30 | 2 | MIT | 33882.27 | a^3H_5 - B244 | (1.041) | 1.169p |
| 2949.965 | 4 | 20 | MIT | 33888.83 | a^5P_1 - $v^3D_3^o?$ | | |
| 2949.500 | 80 | 12 | MIT | 33894.17 | a^3F_4 - $y^3G_4^o$ | 1.282 | 1.199 |
| 2948.858 | tr | - | MF | 33901.55 | b^3P_2 - D235 | | |
| 2946.991 | 60 | 12 | MIT | 33923.03 | a^3F_3 - $x^3D_2^o$ | 1.201 | 1.015 |
| 2946.425 | tr | - | MF | 33929.54 | a^3G_4 - $w^3F_3^o$ | | |
| 2943.921 | 50 | 5 | MIT | 33958.40 | a^5D_3 - $x^3F_2^o$ | 1.422 | 1.029 |

| λ | <u>Arc</u> | <u>Spk</u> | <u>Auth.</u> | σ | <u>Comb.</u> | <u>Zeeman Effect</u> | |
|-----------|------------|------------|--------------|----------|----------------------|----------------------|--------|
| | | | | | | g_1 | g_2 |
| 2943.481 | 30 | - | MIT | 33963.48 | $a^5P_2 - x^3D_2^o$ | | |
| 2940.358 | 50 | 3 | MIT | 33999.55 | $a^5D_4 - x^3F_3^o$ | 1.451 | 1.285 |
| 2939.944 | 30 | 3 | MIT | 34004.34 | $a^3P_1 - w^5D_2^o$ | 1.68 | 1.48 |
| 2939.692 | 12 | 5 | MIT | 34007.25 | $b^3F_3 - w^3G_4^o$ | (1.086) | 0.923p |
| 2939.160 | 25 | - | MF | 34013.41 | $a^5F_1 - z^3P_2^o$ | | |
| 2937.878 | 7 | - | MF | 34028.25 | $b^3F_2 - u^3D_3^o?$ | | |
| 2937.342 | 20 | - | MIT | 34034.46 | $a^5D_1 - y^3S_1^o$ | (1.795) | 1.533p |
| 2936.258 | 10 | - | MIT | 34047.02 | $a^5F_2 - x^5D_3^o$ | | |
| 2936.016 | 20 | - | MIT | 34049.83 | $a^5D_2 - y^3S_1^o$ | (1.232) | 1.527p |
| 2934.841 | tr | - | MF | 34063.46 | $a^3D_1 - C244$ | | |
| 2934.653 | 15 | - | MF | 34065.64 | $a^1G_4 - A242$ | | |
| 2934.185 | 30 | - | MIT | 34071.08 | $a^3F_4 - z^1H_5^o$ | | |
| 2928.492 | 30 | 10 | MIT | 34137.31 | $a^3P_1 - u^3D_2^o$ | (1.684) | 1.084p |
| 2925.076 | 10 | - | MIT | 34177.17 | $a^3P_2 - y^5G_3^o$ | | |
| 2921.156 | 8 | - | MIT | 34223.03 | $a^3F_4 - x^3D_3^o$ | | |
| 2930.257 | 30 | - | MIT | 34233.61 | $a^1G_4 - A243$ | | |
| 2919.608 | 80 | 12 | MIT | 34241.18 | $a^5F_1 - z^3P_1^o$ | 0.000 | 1.308 |
| 2917.774 | 60 | 2 | MIT | 34262.70 | $a^3F_3 - w^3F_4^o$ | | |
| 2917.137 | 20 | 15 | MIT | 34270.18 | $a^3P_1 - u^3D_1^o$ | (1.684) | 1.115p |
| 2916.255 | 100 | 25 | MIT | 34280.55 | $a^5F_4 - y^5F_4^o$ | 1.35 | 1.35 n |
| 2915.625 | 20 | - | MIT | 34287.95 | $a^3G_5 - A226$ | (1.190) | 1.030p |
| 2914.299 | 50 | - | MIT | 34303.55 | $a^3P_0 - u^3D_1^o$ | 0/0 | 1.115 |
| 2913.170 | 50 | 3 | MIT | 34316.85 | $a^3P_1 - w^5D_0^o$ | 1.71 | 0/0 n |
| 2912.435 | 30 | 3 | MIT | 34325.50 | $a^3F_2 - v^3D_2^o$ | | |
| 2910.433 | 3 | - | MF | 34349.11 | $a^5D_0 - v^3D_1^o$ | | |
| 2908.877 | - | 8 | MIT | 34367.49 | $a^5F_1 - z^3P_0^o$ | 0.00 | 0/0 n |
| 2906.315 | 30 | 5 | MIT | 34397.78 | $a^5D_4 - w^3D_3^o$ | | |
| 2905.828 | 20 | 5 | MIT | 34403.55 | $a^3F_4 - z^1F_3^o$ | | |
| 2905.650 | 50 | 12 | MIT | 34405.65 | $a^5F_2 - z^3P_2^o$ | 1.003 | 1.473 |
| 2904.699 | 2 | lwh | MF | 34416.92 | $b^3F_3 - w^5D_3^o$ | | |
| 2904.193 | 3 | - | MF | 34422.92 | $a^5D_3 - y^1F_3^o$ | | |
| 2903.079 | 6 | 2 | MIT | 34436.12 | $a^5D_1 - v^3D_2^o$ | | |
| 2902.860 | 4 | - | MIT | 34438.72 | $a^3P_0 - w^5D_1^o$ | | |
| 2902.098 | 6 | - | MIT | 34447.76 | $a^3P_2 - w^5D_3^o$ | | |
| 2901.937 | 12 | 5 | MIT | 34449.67 | $a^3F_3 - x^3F_2^o$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman g ₁ | Effect g ₂ |
|-----------|-----|-----|-------|----------|--|--------------------------|--------------------------|
| 2901.780 | 4 | - | MIT | 34451.54 | a ⁵ D ₂ - v ³ D ₂ ^o | | |
| 2899.727 | 5 | 1 | MIT | 34475.93 | b ³ F ₂ - u ³ D ₂ ^o | | |
| 2898.538 | 20 | 4 | MIT | 34490.07 | a ⁵ P ₂ - x ³ F ₂ ^o | | |
| 2896.530 | 30 | 4 | MIT | 34499.86 | a ⁵ F ₁ - y ³ D ₁ ^o | | |
| 2895.806 | 3 | - | MF | 34522.61 | a ³ G ₄ - 234 | | |
| 2893.730 | 2 | - | MIT | 34547.37 | b ³ F ₃ - x ⁵ F ₃ ^o | | |
| 2892.475 | 10 | - | MF | 34562.36 | a ⁵ F ₁ - x ⁵ D ₂ ^o | | |
| 2891.649 | 8 | 5 | MIT | 34572.23 | a ³ H ₆ - B244 | 1.16 | 1.16 n |
| 2891.139 | 5 | - | MIT | 34578.33 | a ³ P ₂ - x ⁵ F ₃ ^o | | |
| 2887.995 | 30 | 4 | MIT | 34615.97 | a ⁵ F ₄ - y ⁵ F ₃ ^o | 1.34 | 1.28 |
| 2886.536 | 60 | 50 | MIT | 34633.47 | a ⁵ F ₂ - z ³ P ₁ ^o | 1.001 | 1.318 |
| 2884.848 | 8 | - | MIT | 34653.73 | a ⁵ F ₂ - y ³ D ₃ ^o | | |
| 2884.507 | 20 | 5 | MIT | 34657.83 | a ³ F ₂ - v ³ D ₁ ^o | | |
| 2883.595 | 30 | 5 | MIT | 34668.79 | a ⁵ F ₃ - x ⁵ D ₃ ^o | 1.253 | 1.429 |
| 2882.584 | 4 | lh | MIT | 34680.95 | a ⁵ P ₁ - x ³ P ₁ ^o | | |
| 2881.276 | 30 | 3 | MIT | 34696.81 | a ⁵ F ₁ - x ⁵ D ₀ ^o | 0.00 | 0/0 n |
| 2880.230 | 2 | - | MIT | 34709.29 | a ³ G ₄ - C235 | | |
| 2879.755 | 50 | 12 | MIT | 34715.02 | a ³ F ₄ - w ³ F ₃ ^o | | |
| 2879.360 | 3 | - | MIT | 34719.78 | a ³ F ₂ - z ¹ D ₂ ^o | | |
| 2877.840 | 3 | 1 | MIT | 34738.12 | a ⁵ P ₃ - y ³ D ₂ ^o | | |
| 2877.089 | 5 | 1 | MIT | 34747.18 | a ³ P ₀ - B226 | | |
| 2875.317 | 4 | - | MIT | 34768.60 | a ⁵ D ₁ - v ³ D ₁ ^o | | |
| 2874.984 | 80 | 50 | MIT | 34772.62 | a ⁵ F ₅ - y ⁵ F ₅ ^o | 1.40 | 1.40 n |
| 2874.052 | 5 | - | MIT | 34783.90 | a ⁵ D ₂ - v ³ D ₁ ^o | | |
| 2871.186 | 4 | - | MIT | 34818.62 | a ³ G ₄ - A235 | | |
| 2870.214 | 4 | - | MIT | 34830.41 | a ⁵ D ₁ - z ¹ D ₂ ^o | | |
| 2868.537 | 5 | - | MIT | 34850.77 | a ⁵ P ₂ - w ³ D ₁ ^o | | |
| 2868.412 | 5 | - | MF | 34852.29 | a ³ P ₂ - u ³ D ₃ ^o | | |
| 2868.188 | 8 | 4 | MIT | 34855.01 | b ³ F ₄ - 204? | | |
| 2867.463 | 3 | - | MIT | 34863.83 | a ⁵ D ₄ - w ³ F ₄ ^o | | |
| 2866.644 | 60 | 25 | MIT | 34873.78 | a ⁵ F ₃ - y ³ D ₂ ^o | | |
| 2863.969 | 3 | - | MF | 34906.35 | a ⁵ F ₂ - y ³ D ₁ ^o | | |
| 2863.324 | 30 | 80 | MIT | 34914.22 | a ³ F ₃ - y ¹ F ₃ ^o | | |
| 2863.000 | 6 | - | MIT | 34918.17 | a ⁵ D ₂ - 204 | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman Effect | |
|-----------|-----|-----|-------|----------|---------------------|---------------|--------|
| | | | | | | g_1 | g_2 |
| 2861.719 | 12 | - | MIT | 34933.80 | $a^5D_3 - v^3D_2^o$ | | |
| 2861.407 | 60 | 35 | MIT | 34937.61 | $a^3F_4 - x^3F_3^o$ | | |
| 2860.374 | 3 | - | MIT | 34950.22 | $a^5G_5 - B231$ | | |
| 2860.016 | 60 | 12 | MIT | 34954.60 | $a^5P_2 - y^1F_3^o$ | | |
| | | | | or | $a^5F_2 - x^5D_2^o$ | | |
| 2857.244 | 2 | - | MF | 34988.51 | $b^3F_4 - y^1H_5^o$ | | |
| 2854.870 | 2 | 15 | MIT | 35017.60 | $a^3P_1 - 230$ | | |
| 2854.074 | 60 | 35 | MIT | 35027.37 | $a^5F_3 - z^3P_2^o$ | 1.249 | 1.469 |
| 2851.107 | 3 | - | MF | 35063.82 | $a^5P_2 - y^3S_1^o$ | | |
| 2848.579 | 50 | 3 | MIT | 35094.93 | $a^5F_1 - x^5D_1^o$ | | |
| 2846.749 | 3 | - | MIT | 35117.49 | $a^3F_2 - x^3P_1^o$ | | |
| 2846.535 | 4 | - | MF | 35120.13 | $b^3P_2 - A242$ | | |
| | | | | or | $a^3H_5 - 245$ | | |
| 2846.316 | 12 | 1 | MIT | 35122.84 | $b^3F_4 - w^5D_4^o$ | | |
| 2845.524 | 8 | - | MIT | 35132.61 | $a^5P_3 - z^1D_2^o$ | | |
| 2843.171 | 30 | 3 | MIT | 35161.68 | $a^5D_1 - x^3P_2^o$ | | |
| 2842.755 | 20 | - | MIT | 35166.83 | $a^3P_2 - w^5D_2^o$ | 1.793 | 1.420 |
| 2842.533 | 30 | - | MIT | 35169.57 | $a^3D_3 - 245$ | | |
| 2840.539 | 60 | 8 | MIT | 35194.26 | $a^3F_4 - x^3G_5^o$ | (1.284) | 1.198p |
| 2837.274 | 20 | - | MIT | 35234.76 | $a^3G_3 - A243$ | | |
| 2836.573 | 30 | 1h | MIT | 35243.47 | $a^5D_2 - x^3P_1^o$ | | |
| 2836.147 | 20 | - | MIT | 35248.76 | $a^1G_4 - 244$ | | |
| 2834.001 | 30 | 5 | MIT | 35275.45 | $a^5F_3 - y^3D_3^o$ | 1.242 | 1.375 |
| 2832.625 | 20 | - | MIT | 35292.58 | $a^3G_4 - 239$ | | |
| 2832.045 | 3 | - | MF | 35299.81 | $a^3P_2 - u^3D_2^o$ | | |
| 2830.575 | 20 | - | MF | 35318.40 | $b^3P_2 - D243$ | | |
| 2829.160 | 50 | 8 | MIT | 35335.81 | $a^3F_4 - w^3D_3^o$ | | |
| 2827.869 | 30 | 12 | MIT | 35352.04 | $a^5F_4 - x^5D_4^o$ | | |
| | | | | or | $z^7D_3^o - 63$ | | |
| 2827.522 | 5 | 8 | MIT | 35356.28 | $b^3F_2 - 230$ | | |
| 2823.892 | 5 | - | MF | 35401.72 | $b^3P_2 - E243$ | | |
| 2822.032 | 50 | 5 | MIT | 35425.04 | $a^3F_3 - v^3D_2^o$ | | |
| 2818.952 | 50 | 3 | MIT | 35463.76 | $a^5P_3 - x^3P_2^o$ | 1.629 | 1.428 |
| 2818.815 | 30 | - | MIT | 35465.48 | $a^5P_2 - v^3D_2^o$ | | |
| 2818.361 | 50 | 12 | MIT | 35471.20 | $a^5F_5 - w^5F_4^o$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman g_1 | Effect g_2 |
|-----------|-----|-----|-------|----------|----------------------|-----------------|-----------------|
| 2817.093 | 50 | 4 | MIT | 35487.16 | $a^5F_2 - x^5D_1^o$ | 0.994 | 1.565 |
| | | | | or | $b^3F_4 - x^5F_4^o$ | | |
| 2814.869 | 30 | - | MIT | 35515.20 | $a^5D_4 - y^1F_3^o$ | | |
| 2810.553 | 50 | 200 | MIT | 35569.73 | $a^5F_4 - x^5D_3^o$ | | |
| 2810.033 | 50 | 12 | MIT | 35576.31 | $a^5F_3 - x^5D_2^o$ | 1.269 | 1.462 |
| 2808.228 | 50 | - | MIT | 35599.17 | $b^3F_2 - A231$ | | |
| 2803.493 | 50 | 4 | MIT | 35659.24 | $a^5D_3 - x^3P_2^o$ | | |
| 2802.162 | 30 | 40 | MIT | 35676.24 | $a^3G_4 - A241?$ | | |
| 2801.865 | 30 | - | MIT | 35680.02 | $b^3F_4 - y^5G_3^o$ | | |
| 2800.130 | 20 | - | MF | 35702.13 | $b^3F_4 - 211$ | | |
| 2792.645 | 50 | 1 | MIT | 35797.8L | $a^5P_2 - x^3D_1^o$ | | |
| 2791.052 | 10 | 3 | MIT | 35818.24 | $a^5D_1 - y^5G_2^o$ | | |
| 2786.723 | 112 | -- | MF | 35873.88 | $a^5F_2 - z^3S_1^o$ | | |
| 2785.650 | 60 | 200 | MIT | 35887.70 | $a^3F_2 - w^5D_3^o$ | | |
| 2785.346 | 125 | - | MF | 35891.62 | $a^3F_3 - 204$ | | |
| 2784.882 | 6 | - | MIT | 35897.60 | $b^3F_2 - 235$ | | |
| 2784.342 | tr | - | MF | 35904.56 | $a^3P_2 - 227$ | | |
| 2782.209 | 50 | 1 | MIT | 35932.09 | $a^5P_2 - 204$ | | |
| 2777.497 | 5 | 50 | MIT | 35993.04 | $a^5F_2 - y^5P_3^o?$ | | |
| 2775.907 | 50 | - | MIT | 36013.65 | $a^5D_2 - w^5D_3^o$ | | |
| 2775.554 | 12 | - | MF | 36018.23 | $a^3F_2 - x^5F_3^o$ | | |
| 2775.185 | 50 | - | MIT | 36023.02 | $a^3P_1 - 236$ | | |
| 2774.483 | 60 | 2 | MIT | 36032.14 | $a^5D_3 - x^5F_4^o$ | | |
| 2772.963 | 30 | 8 | MIT | 36051.89 | $a^5P_3 - 211$ | | |
| 2772.612 | 50 | - | MIT | 36056.45 | $a^3P_0 - 236$ | | |
| 2770.701 | 60 | - | MIT | 36081.32 | $b^3F_4 - w^5D_3^o$ | | |
| 2770.299 | 60 | 3 | MIT | 36086.55 | $a^5D_3 - w^3G_4^o$ | | |
| 2769.912 | 10 | - | MF | 36091.59 | $b^3F_3 - w^3F_3^o$ | | |
| 2767.953 | 7 | - | MF | 36117.13 | $a^3G_4 - A243$ | | |
| 2767.710 | 20 | - | MF | 36120.31 | $a^5P_3 - y^5G_2^o$ | | |
| 2764.725 | 50 | 1 | MIT | 36159.30 | $a^3F_3 - w^5D_4^o$ | | |
| 2763.903 | 30 | 1 | MIT | 36170.05 | $a^5P_1 - w^5D_2^o$ | | |
| 2763.419 | 50 | 15 | MIT | 36176.39 | $a^5F_4 - y^3D_3^o$ | | |
| 2763.142 | 30 | 5 | MIT | 36180.02 | $a^3P_2 - 230$ | | |
| 2762.306 | 50 | 3 | MIT | 36190.97 | $a^5P_2 - x^3P_2^o$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman Effect g_1 g_2 |
|-----------|-----|-----|-------|----------|---|------------------------------|
| 2759.690 | 100 | 2 | MF | 36225.27 | $a^5D_3 - y^5G_3^o$ | |
| 2758.009 | 20 | - | MIT | 36247.35 | $a^5D_3 - 211$ | |
| 2757.808 | 50 | - | MIT | 36250.00 | $a^3G_3 - 244$ | |
| 2757.075 | 30 | - | MIT | 36259.63 | $a^5D_4 - y^5G_5^o$ | |
| 2754.612 | 50 | 1 | MIT | 36292.05 | $a^3F_2 - u^3D_3^o$ or $b^3F_3 - 231$ | (1.089) 1.552p |
| 2753.986 | 25 | - | MF | 36300.30 | $a^5P_3 - w^5D_3^o?$ | |
| 2752.266 | 30 | - | MIT | 36322.98 | $a^3P_2 - 231$ | |
| 2750.350 | 50 | - | MIT | 36348.28 | $a^3G_4 - C243$ | |
| 2749.837 | 60 | - | MF | 36355.06 | $b^3F_4 - u^3D_3^o$ | |
| 2749.677 | 50 | 10 | MIT | 36357.18 | $b^3P_1 - G244$ or $a^3F_3 - x^3G_3^o$ | |
| 2749.033 | 20 | - | MF | 36365.70 | $a^3F_2 - w^3G_3^o$ | |
| 2748.052 | 25 | - | MF | 36378.67 | $a^3P_1 - 240$ | |
| 2747.972 | 50 | 100 | MIT | 36379.73 | $a^5D_4 - y^5G_4^o?$ | |
| 2745.834 | 50 | 88 | MIT | 36408.06 | $b^3F_4 - 216$ | |
| 2745.076 | 30 | - | MIT | 36418.11 | $a^5D_2 - u^3D_3^o$ | |
| 2744.713 | 20 | - | MF | 36422.93 | $a^3P_2 - A231$ | |
| 2743.936 | 50 | 100 | MIT | 36433.24 | $a^3F_4 - z^3I_5^o?$ | |
| 2740.223 | 30 | - | MIT | 36482.61 | $a^5P_1 - w^5D_0^o$ | |
| 2739.473 | 15 | - | MF | 36492.59 | $a^5D_4 - 204$ | |
| 2739.218 | 60 | 5 | MIT | 36495.99 | $a^5D_3 - w^5D_3^o$ | |
| 2735.718 | 60 | 60 | MIT | 36542.68 | $a^5F_5 - x^5D_4^o$ | (1.397) 1.474n |
| 2734.135 | 6 | - | MF | 36563.84 | $a^5D_0 - u^3D_1^o$ | |
| 2733.592 | 80 | 4 | MIT | 36571.10 | $a^5P_1 - w^5D_1^o$ | |
| 2733.087 | 10 | - | MIT | 36577.86 | $a^3F_3 - w^3G_4^o$ | |
| 2731.901 | 50 | - | MIT | 36593.73 | $a^5P_3 - A214$ | |
| 2730.932 | 80 | 5 | MIT | 36606.72 | $a^3F_2 - w^5D_2^o$ | |
| 2730.328 | 60 | 2 | MIT | 36614.81 | $a^5F_3 - y^5P_3^o$ | |
| 2729.455 | 60 | - | MIT | 36626.52 | $a^5D_3 - x^5F_3^o$ | |
| 2728.834 | 60 | - | MIT | 36634.86 | $b^3F_4 - w^3G_5^o$ | |
| 2726.973 | 60 | 10 | MIT | 36659.96 | $a^1G_4 - 245$ | |
| 2726.368 | 12 | Oh | MF | 36668.00 | $a^5F_1 - y^5P_1^o$ | |
| 2724.063 | 60 | 4 | MIT | 36699.02 | $a^5D_0 - w^5D_1^o$ | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman g_1 | Effect g_2 |
|-----------|-----|-----|-------|----------|----------------------|-----------------|-----------------|
| 2722.824 | 10 | - | MIT | 36715.72 | $a^3P_2 - 284$ | | |
| 2722.697 | 40 | 4 | MF | 36717.46 | $a^5D_1 - w^5D_2^o$ | 1.794 | 1.480 |
| | | | | | or $b^3F_2 - 240$ | | |
| 2722.391 | 20 | - | MIT | 36721.56 | $a^3P_2 - 285$ | | |
| 2721.562 | 60 | 5 | MIT | 36732.74 | $a^5D_2 - w^5D_2^o$ | 1.236 | 1.487 |
| 2719.515 | 100 | 30 | MIT | 36760.39 | $a^5D_4 - w^5D_4^o$ | 1.46 | 1.46 n |
| 2717.399 | 50 | 100 | MIT | 36789.01 | $a^5F_1 - y^3P_0^o$ | | |
| 2717.007 | 30 | - | MIT | 36794.32 | $b^3P_1 - C244$ | | |
| 2715.776 | 50 | - | MIT | 36811.00 | $a^5F_1 - y^5P_1^o$ | | |
| 2715.241 | 20 | 5h | MIT | 36818.25 | $a^3P_1 - C242$ | | |
| 2713.737 | 60 | 2h | MIT | 36838.65 | $a^5D_4 - x^5F_5^o$ | | |
| 2713.070 | - | 80 | MIT | 36847.71 | $a^5P_2 - y^5G_2^o?$ | | |
| 2712.879 | 30 | - | MIT | 36850.30 | $a^5D_1 - u^3D_2^o$ | | |
| 2711.333 | 15 | - | MF | 36871.32 | $b^3F_3 - C235$ | | |
| 2710.738 | 20 | - | MIT | 36879.41 | $a^5P_1 - B226$ | | |
| 2709.766 | 20 | - | MF | 36892.64 | $b^3F_3 - D235$ | | |
| 2709.204 | 60 | 8 | MIT | 36900.29 | $a^5D_3 - u^3D_3^o$ | | |
| 2709.051 | 20 | 2h | MF | 36902.37 | $a^3P_2 - C235$ | | |
| 2708.646 | 20 | - | MIT | 36907.89 | $a^5P_1 - 227$ | | |
| 2707.971 | 50 | 3 | MIT | 36917.09 | $a^5F_3 - y^5P_2^o$ | | |
| 2707.473 | 30 | - | MIT | 36923.88 | $a^3P_2 - D235$ | | |
| 2705.329 | 12 | - | MIT | 36953.14 | $a^5D_3 - 216$ | | |
| 2704.991 | 10 | - | MF | 36957.76 | $b^3F_2 - 241$ | | |
| | | | | | or $a^3G_5 - C243$ | | |
| 2703.801 | 60 | 3 | MIT | 36974.02 | $a^5D_3 - w^3G_3^o$ | | |
| 2703.316 | 12 | - | MIT | 36980.65 | $b^3F_3 - A235$ | | |
| 2703.125 | 25 | - | MF | 36983.27 | $a^5D_1 - u^3D_1^o$ | | |
| 2702.832 | 80 | 8 | MIT | 36987.28 | $a^3F_3 - w^5D_3^o$ | 1.197 | 1.449 |
| 2702.416 | 12 | - | MIT | 36992.97 | $a^3P_1 - 243$ | | |
| 2701.338 | 60 | 8 | MIT | 37007.73 | $a^3F_2 - w^5D_1^o$ | 1.087 | 1.439 |
| 2700.481 | 50 | - | MIT | 37019.48 | $a^5P_3 - w^5D_2^o$ | | |
| 2699.883 | 30 | 3 | MIT | 37027.67 | $a^5P_2 - w^5D_3^o$ | | |
| 2699.805 | 40 | 2 | MF | 37028.74 | $a^5F_2 - y^3P_2^o$ | | |
| 2699.718 | 40 | 0 | MF | 37029.94 | $a^5D_1 - w^5D_0^o$ | | |
| 2698.054 | 12 | 6 | MIT | 37052.77 | $a^5F_4 - y^3F_4^o$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman Effect | |
|-----------|-----|-----|-------|----------|---------------------|---------------|-------|
| | | | | | | g_1 | g_2 |
| 2697.512 | 30 | - | MIT | 37060.22 | $a^5F_2 - y^5P_1^o$ | | |
| 2693.287 | 80 | 2h | MIT | 37118.35 | $a^5D_1 - w^5D_1^o$ | | |
| 2692.844 | 30 | - | MIT | 37124.46 | $a^5D_4 - x^5F_4^o$ | | |
| 2692.271 | 40 | - | MF | 37132.36 | $a^3G_4 - E244$ | | |
| 2690.820 | 8 | - | MIT | 37152.38 | $a^5P_3 - u^3D_2^o$ | | |
| | | | | or | $b^3F_4 - 225$ | | |
| 2690.399 | 20 | - | MIT | 37158.19 | $a^5P_2 - x^5F_3^o$ | | |
| 2689.897 | 50 | - | MIT | 37165.13 | $a^3P_2 - B235$ | | |
| 2688.900 | 30 | - | MIT | 37178.91 | $a^5D_4 - w^3G_4^o$ | | |
| 2688.587 | 30 | 1 | MIT | 37183.24 | $a^5P_1 - 230$ | | |
| 2687.138 | 12 | - | MIT | 37203.29 | $a^5F_2 - y^3P_1^o$ | | |
| 2686.294 | 80 | 12 | MIT | 37214.97 | $a^5D_3 - w^5D_2^o$ | | |
| 2679.762 | 12 | 1h | MIT | 37305.69 | $a^3G_4 - B244$ | | |
| 2678.893 | 15 | - | MF | 37317.78 | $a^3F_4 - y^5G_4^o$ | | |
| | | | | or | $a^5D_4 - y^5G_3^o$ | | |
| 2678.178 | 10 | - | MIT | 37327.74 | $a^5F_1 - y^3F_2^o$ | | |
| 2677.896 | 10 | - | MIT | 37331.67 | $b^3F_2 - 243$ | | |
| 2677.38 | 12 | - | MIT | 37339.73 | $a^5D_4 - 211$ | | |
| 2676.972 | 12 | - | MIT | 37344.56 | $a^3F_2 - 227$ | | |
| 2676.735 | 3 | - | MF | 37347.86 | $a^5D_3 - u^3D_2^o$ | | |
| 2674.837 | 12 | - | MF | 37374.36 | $b^3F_4 - A226$ | | |
| 2674.477 | 15 | - | MF | 37379.40 | $a^3P_2 - 238$ | | |
| 2673.603 | 50 | 3 | MIT | 37391.61 | $a^3F_3 - u^3D_3^o$ | | |
| 2670.717 | 8 | - | MIT | 37432.02 | $a^5P_2 - u^3D_3^o$ | | |
| 2668.345 | 20 | - | MIT | 37465.29 | $a^3F_3 - w^3G_3^o$ | | |
| 2667.968 | 50 | - | MIT | 37470.58 | $a^5D_2 - 227$ | | |
| 2665.722 | 12 | - | MIT | 37502.15 | $a^5P_3 - 225$ | | |
| 2665.468 | 20 | - | MF | 37505.73 | $a^5P_2 - w^3G_3^o$ | | |
| 2665.166 | 12 | - | MF | 37509.98 | $b^3F_3 - 240$ | | |
| 2664.757 | 60 | 5 | MIT | 37515.73 | $a^5F_4 - y^5P_3^o$ | 1.346 | 1.625 |
| 2662.959 | | - | MF | 37541.06 | $a^3P_2 - 240$ | | |
| 2661.438 | 10 | - | MF | 37562.51 | $a^3F_2 - w^3F_3^o$ | | |
| 2660.603 | 12 | - | MIT | 37574.30 | $b^3F_4 - w^3F_4^o$ | | |
| 2659.615 | 80 | 12 | MIT | 37588.26 | $a^5D_4 - w^5D_3^o$ | | |
| 2658.770 | 10 | - | MIT | 37600.20 | $b^3F_2 - E243$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman Effect | |
|-----------|-----|-----|-------|----------|-----------------------|---------------|-------|
| | | | | | | g_1 | g_2 |
| 2657.381 | 12 | - | MF | 37619.86 | a^3F_2 - 230 | | |
| 2656.834 | 15 | - | MF | 37627.60 | a^5P_1 - $w^3F_2^o$ | | |
| 2656.692 | 30 | - | MIT | 37629.61 | a^5P_3 - 226 | | |
| 2655.219 | 20 | - | MIT | 37650.49 | a^5F_3 - $y^3P_2^o$ | | |
| 2654.465 | 8 | - | MIT | 37661.18 | a^3G_3 - 245 | | |
| 2652.134 | 8 | 2 | MIT | 37694.28 | b^3F_2 - B243 | | |
| 2651.841 | 100 | 9 | MIT | 37698.44 | a^3F_4 - $w^5D_4^o$ | 1.284 | 1.473 |
| 2651.292 | 60 | 5 | MIT | 37706.25 | a^3F_3 - $w^5D_2^o$ | 1.21 | 1.50 |
| 2650.405 | 50 | - | MIT | 37718.87 | a^5D_4 - $x^5F_3^o$ | | |
| 2649.992 | 20 | - | MIT | 37724.74 | a^5P_1 - 235 | | |
| 2649.581 | 15 | - | MF | 37730.60 | a^5D_1 - 230 | | |
| 2648.780 | 30 | 150 | MIT | 37742.01 | a^3G_5 - 244 | | |
| 2648.500 | 12 | - | MF | 37746.00 | a^5D_2 - 230 | | |
| 2648.451 | 20 | 1 | MIT | 37746.70 | a^5P_2 - $w^5D_2^o$ | | |
| | | | | or | b^3P_1 - 246 | | |
| 2647.315 | 50 | 5 | MIT | 37762.89 | a^3F_2 - 231 | | |
| 2642.960 | 150 | - | MIT | 37825.11 | a^5D_3 - 226 | | |
| 2641.978 | 20 | - | MIT | 37839.17 | a^3F_3 - $u^3D_2^o$ | | |
| 2641.462 | 12 | - | MIT | 37846.55 | a^5F_4 - $x^3F_4^o$ | | |
| 2640.327 | 60 | 5 | MIT | 37862.83 | a^3F_2 - A231 | | |
| 2639.870 | 50 | - | MIT | 37869.38 | a^3P_2 - A241 | | |
| 2638.510 | 60 | 4 | MIT | 37888.90 | a^5D_2 - 231 | | |
| 2636.968 | 15 | - | MF | 37911.06 | a^5F_1 - $x^3D_1^o$ | | |
| 2636.670 | 60 | - | MIT | 37915.34 | a^3G_5 - B244 | | |
| 2635.861 | 30 | 100 | MIT | 37926.98 | a^5P_1 - D235 | | |
| 2632.504 | 50 | 1 | MIT | 37975.34 | a^5P_3 - $w^3F_3^o$ | | |
| 2632.127 | 50 | 2 | MIT | 37980.78 | a^3P_2 - C242 | | |
| 2631.568 | 60 | 3 | MIT | 37988.84 | a^5D_2 - A231 | | |
| 2631.303 | 20 | 10 | MIT | 37992.67 | a^5D_4 - $u^3D_3^o$ | | |
| 2630.235 | 50 | 1h | MIT | 38008.09 | b^3F_2 - F243 | | |
| 2629.928 | 20 | - | MIT | 38012.53 | a^5P_2 - $u^3D_1^o$ | | |
| 2628.534 | 12 | - | MIT | 38032.69 | a^5P_3 - 230 | | |
| 2627.651 | 60 | 1 | MIT | 38045.41 | a^5D_4 - 216 | | |
| 2626.475 | 50 | - | MIT | 38062.50 | a^3F_4 - $x^5F_4^o$ | | |
| 2626.352 | 20 | 50 | MIT | 38064.29 | a^3F_2 - $w^3F_2^o$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman Effect |
|-----------|-----|------|-------|----------|----------------------|---------------|
| | | | | | | g_1 g_2 |
| 2626.210 | 50 | - | MIT | 38066.35 | $a^5D_4 - w^3G_3^0$ | |
| 2625.086 | 40 | - | MF | 38082.64 | $a^5P_4 - z^3H_4^0$ | |
| | | | | | or $b^3P_2 - 246$ | |
| 2622.721 | 3 | - | MF | 38116.98 | $a^3F_4 - w^3G_4^0$ | |
| 2621.081 | 20 | 4 | MIT | 38140.83 | $b^3F_4 - 233$ | |
| 2620.982 | 25 | - | MF | 38142.12 | $a^3P_2 - A242$ | |
| 2620.876 | 20 | - | MIT | 38143.81 | $a^5F_3 - y^3G_3^0$ | |
| 2620.610 | 50 | 5 | MIT | 38147.68 | $a^5P_2 - w^5D_1^0$ | |
| 2620.068 | 10 | 6 | MIT | 38155.58 | $a^3F_2 - 234$ | |
| | | | | | or $a^3P_2 - 243$ | |
| 2619.671 | 50 | 5 | MIT | 38161.36 | $a^3F_2 - 235$ | |
| 2619.020 | 30 | 1h | MIT | 38170.84 | $a^5D_3 - w^3F_3^0$ | |
| 2618.740 | 10 | - | MIT | 38174.92 | $a^5D_1 - w^3F_2^0$ | |
| 2617.789 | 50 | 4 | MIT | 38188.79 | $a^5P_1 - 236$ | |
| 2617.688 | 25 | 0 | MF | 38190.26 | $a^5D_2 - w^3F_2^0$ | |
| 2615.093 | 60 | 100 | MIT | 38228.16 | $a^5D_3 - 230$ | |
| 2614.586 | 50 | 4 | MIT | 38235.57 | $a^5F_2 - z^1F_3^0?$ | |
| 2614.068 | 60 | 3 | MIT | 38243.15 | $a^5F_4 - y^3F_3^0$ | |
| 2613.206 | 5 | 10wh | MIT | 38255.76 | $a^3F_4 - y^5G_3^0$ | |
| 2612.917 | 5 | - | MIT | 38259.99 | $a^5F_4 - y^3G_5^0$ | |
| 2612.068 | 100 | 30 | MIT | 38272.43 | $a^5D_4 - w^3G_5^0$ | |
| 2611.702 | 20 | - | MF | 38277.79 | $a^3F_4 - 211$ | |
| 2611.605 | 12 | - | MF | 38279.21 | $b^3F_3 - A243$ | |
| 2611.048 | 50 | 5 | MIT | 38287.37 | $a^5D_2 - 235$ | |
| 2609.485 | 30 | 6 | MIT | 38310.31 | $a^3P_2 - A243$ | |
| 2609.057 | 80 | 12 | MIT | 38316.59 | $a^5D_0 - 236$ | |
| | | | | | or $a^3F_3 - 226$ | |
| 2607.347 | 12 | - | MIT | 38341.72 | $a^5F_3 - y^3F_2^0$ | |
| 2606.944 | 10 | 15 | MIT | 38347.65 | $a^5F_3 - y^3G_4^0$ | |
| 2605.857 | 50 | 3 | MIT | 38363.64 | $a^3F_2 - D235$ | |
| 2605.349 | 50 | 4 | MIT | 38371.12 | $a^5D_3 - 231$ | |
| 2604.318 | 12 | - | MIT | 38386.31 | $a^5P_3 - B231$ | |
| 2602.995 | 10 | 2h | MF | 38405.82 | $a^3P_1 - F244$ | |
| 2601.775 | 7 | - | MF | 38423.83 | $a^3P_2 - E243$ | |
| 2600.727 | 15 | - | MF | 38439.31 | $a^3P_0 - F244$ | |

| <u>λ</u> | <u>Arc</u> | <u>Spk</u> | <u>Auth.</u> | <u>σ</u> | <u>Comb.</u> | <u>Zeeman</u> g_1 | <u>Effect</u> g_2 |
|-----------------------------|------------|------------|--------------|----------------------------|-----------------------|------------------------|------------------------|
| 2598.766 | 4 | 50 | MIT | 38468.81 | a^5D_2 - C235? | | |
| 2598.678 | 5 | - | MF | 38469.62 | a^5F_2 - $w^3F_2^o$ | | |
| 2598.581 | 20 | - | MIT | 38471.05 | a^5D_3 - A231 | | |
| 2597.680 | 2 | - | MF | 38484.40 | a^5P_2 - 227 | | |
| 2597.518 | 10 | 18 | MIT | 38486.79 | b^3F_3 - B243 | | |
| 2597.326 | 30 | - | MIT | 38489.64 | a^5D_2 - D235 | | |
| 2595.932 | 8 | - | MIT | 38510.31 | b^3F_3 - C243 | | |
| 2595.639 | 20 | - | MIT | 38514.65 | b^3F_4 - A235 | | |
| 2595.425 | 10 | - | MIT | 38517.83 | a^3P_2 - B243 | | |
| 2594.852 | 60 | 4 | MIT | 38526.33 | a^3F_4 - $w^5D_3^o$ | | |
| 2593.700 | 20 | - | MIT | 38543.44 | a^3G_4 - 245 | (1.033) | 1.092up |
| 2593.636 | 10 | - | MIT | 38544.39 | a^5P_1 - 240 | | |
| 2592.024 | 60 | 6 | MIT | 38568.36 | a^5P_3 - 234 | | |
| 2591.640 | 30 | 1 | MIT | 38574.08 | a^5P_3 - 235 | | |
| 2591.118 | 50 | - | MIT | 38581.85 | a^5D_3 - D231 | | |
| 2590.971 | 12 | 100 | MIT | 38584.04 | a^5D_4 - 222 | | |
| 2589.566 | 60 | 3 | MIT | 38604.97 | a^3F_2 - B235 | | |
| 2588.195 | 10 | - | MIT | 38625.42 | a^3F_2 - 236 | | |
| 2586.084 | 12 | - | MIT | 38656.95 | a^3F_4 - $x^5F_3^o$ | | |
| 2585.735 | 50 | - | MIT | 38662.16 | a^3F_3 - $w^3F_3^o$ | | |
| 2585.341 | 20 | - | MIT | 38668.05 | b^3F_4 - B235 | | |
| 2584.781 | 3 | - | MF | 38676.43 | a^5F_3 - $x^3D_3^o$ | | |
| 2584.138 | 50 | 3 | MIT | 38686.05 | a^5D_3 - 233 | | |
| 2582.115 | 2 | - | MF | 38716.36 | b^3F_2 - A244 | | |
| 2581.910 | 30 | 2 | MIT | 38719.44 | a^3F_3 - 230 | | |
| 2581.137 | 60 | 2 | MIT | 38731.03 | a^5D_2 - B235 | | |
| 2580.799 | 50 | 3 | MIT | 38736.10 | a^5D_1 - 236 | | |
| 2580.029 | 20 | - | MF | 38747.66 | b^3F_4 - A237 | | |
| 2579.776 | 25 | - | MF | 38751.46 | a^5D_2 - 236 | | |
| 2579.533 | 30 | 4 | MIT | 38755.10 | a^5P_3 - C235 | | |
| 2579.217 | 30 | 1 | MIT | 38759.86 | a^5P_2 - 230 | | |
| 2578.949 | 20 | - | MIT | 38763.89 | a^5D_3 - 234 | | |
| 2578.567 | 30 | 9 | MIT | 38769.63 | a^5D_3 - 235 | | |
| 2575.242 | 30 | 1 | MIT | 38819.68 | a^3F_4 - A214 | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman Effect | |
|-----------|-----|-----|-------|----------|-----------------------|---------------|--------|
| | | | | | | g_1 | g_2 |
| 2573.203 | 4 | - | MF | 38850.44 | a^5F_3 - A181 | | |
| 2572.409 | 30 | 1 | MIT | 38862.43 | a^3F_3 - 231 | | |
| 2572.279 | 30 | 1 | MIT | 38864.40 | a^5P_3 - A235 | | |
| 2571.085 | 6 | 100 | MIT | 38882.44 | b^3F_4 - 238? | | |
| 2569.736 | 20 | - | MIT | 38902.86 | a^5P_2 - 231 | | |
| 2568.767 | 60 | 8 | MIT | 38917.54 | a^5D_4 - 226 | | |
| 2567.895 | 30 | - | MIT | 38930.74 | a^3F_4 - $u^3D_3^0$ | (1.284) | 1.541p |
| 2566.587 | 30 | 25 | MIT | 38950.58 | a^5D_3 - C235 | | |
| 2565.808 | 12 | 5 | MIT | 38962.41 | a^3F_3 - A231 | | |
| 2565.182 | 50 | - | MIT | 38971.91 | a^5D_3 - D235 | | |
| 2564.809 | - | 4wh | MIT | 38977.60 | a^5F_5 - $z^3H_6^0$ | | |
| 2564.577 | 50 | - | MIT | 38981.11 | a^3F_2 - 240 | | |
| 2564.417 | 8 | - | MIT | 38983.54 | a^3F_4 - 216 | | |
| 2564.386 | 15 | - | MF | 38984.01 | a^5P_1 - C242 | | |
| 2563.151 | 50 | 1 | MIT | 39002.79 | a^5P_2 - A231 | | |
| 2563.044 | 7 | - | MF | 39004.42 | a^3F_4 - $w^3G_3^0$ | | |
| 2562.173 | 5 | - | MIT | 39017.68 | a^5P_3 - B235 | | |
| 2561.803 | 20 | - | MIT | 39023.31 | b^3F_4 - A239 | | |
| | | | | | or a^3P_0 - C244 | | |
| 2560.894 | 25 | - | MF | 39037.17 | a^5F_5 - $x^3F_4^0$ | | |
| 2560.521 | 7 | - | MF | 39042.85 | a^5F_2 - $w^3D_2^0$ | | |
| 2560.262 | 60 | 5 | MIT | 39046.80 | a^5P_3 - 237 | (1.624) | 1.322p |
| 2559.405 | 30 | 4 | MIT | 39059.87 | a^5D_3 - A235 | | |
| 2558.535 | 50 | 1 | MIT | 39073.15 | a^3F_3 - B231 | | |
| 2557.697 | 30 | 5wh | MIT | 39085.96 | a^5F_4 - $z^1G_4^0$ | | |
| 2557.325 | 7 | - | MF | 39091.64 | a^5D_1 - 240 | | |
| 2556.947 | 15 | - | MF | 39097.42 | a^5P_3 - A237 | | |
| 2556.312 | 50 | - | MIT | 39107.13 | a^5D_2 - 240 | | |
| 2555.996 | 30 | - | MIT | 39111.97 | a^5D_0 - C242 | | |
| 2553.310 | 6 | 5 | MIT | 39153.11 | a^3G_5 - 245 | | |
| 2552.941 | 12 | - | MF | 39158.76 | a^5P_1 - 243 | | |
| 2552.305 | 20 | - | MIT | 39168.52 | a^5F_3 - $w^3F_3^0$ | | |
| 2551.726 | 30 | - | MIT | 39177.41 | a^3F_3 - 233 | | |
| 2549.982 | 20 | - | MF | 39204.20 | a^5P_2 - $w^3F_2^0$ | | |
| 2549.577 | 50 | 3 | MIT | 39210.43 | a^3F_4 - $w^3G_5^0$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman Effect g_1 g_2 |
|-----------|-----|-----|-------|----------|---------------------|------------------------------|
| 2549.479 | 20 | 3 | MIT | 39211.94 | $a^5D_4 - w^3F_4^o$ | |
| 2548.870 | 15 | - | MF | 39221.31 | $a^3F_2 - 241$ | |
| 2548.172 | 15 | - | MF | 39232.05 | $a^5P_3 - 238$ | |
| 2547.508 | 12 | - | MIT | 39242.27 | $a^5D_3 - 237$ | |
| 2547.099 | 5 | - | MF | 39248.57 | $a^5F_4 - y^3G_4^o$ | |
| 2546.671 | 8 | 3 | MIT | 39255.17 | $a^3F_3 - 234$ | |
| 2546.299 | 25 | - | MF | 39260.91 | $a^3F_3 - 235$ | |
| 2546.153 | 20 | - | MF | 39263.15 | $a^5D_4 - w^3F_3^o$ | |
| 2545.495 | 12 | - | MF | 39273.30 | $a^5F_5 - z^3H_4^o$ | |
| 2544.222 | 60 | 6 | MIT | 39292.95 | $a^5D_3 - A237$ | |
| 2543.678 | 20 | - | MIT | 39301.36 | $a^5P_2 - 235$ | |
| 2543.164 | 60 | - | MF | 39309.30 | $a^3F_2 - A241$ | |
| 2541.284 | 50 | - | MIT | 39338.38 | $a^5P_3 - 239$ | |
| 2540.705 | 15 | - | MF | 39347.34 | $a^5D_2 - 241$ | |
| 2539.092 | 40 | - | MF | 39372.34 | $b^3F_4 - A241$ | |
| 2538.428 | 25 | - | MF | 39382.63 | $b^3F_4 - B241$ | |
| 2537.881 | 15 | - | MF | 39391.12 | $a^5F_3 - x^3F_3^o$ | |
| 2537.706 | 15 | - | MF | 39393.84 | $a^5P_3 - 240$ | |
| 2535.977 | 25 | - | MF | 39420.69 | $a^3F_2 - C242$ | |
| 2535.532 | tr | - | MF | 39427.63 | $a^5D_3 - 238$ | |
| 2535.039 | 25 | - | MF | 39435.28 | $a^5D_2 - A241$ | |
| 2534.611 | 20 | - | MF | 39441.94 | $a^3F_3 - C235$ | |
| 2534.050 | 4 | - | MF | 39450.67 | $a^5F_5 - y^3G_5^o$ | |
| 2533.236 | 50 | - | MIT | 39463.33 | $a^3F_3 - D235$ | |
| | | | | or | $a^5D_4 - 231$ | |
| 2532.374 | 20 | - | MF | 39476.78 | $b^3F_4 - B242$ | |
| 2532.015 | 10 | - | MIT | 39482.37 | $a^5P_2 - C235$ | |
| 2530.653 | 2 | 1 | MF | 39503.62 | $a^5P_2 - D235$ | |
| 2530.04 | - | 10 | E+H | 39513.19 | $a^5D_2 - 242$ | |
| 2529.464 | 20 | - | MF | 39522.19 | $a^3F_4 - 222$ | |
| 2528.878 | 60 | 2 | MIT | 39531.35 | $a^5D_1 - C242$ | |
| 2528.715 | 30 | - | MIT | 39533.90 | $a^5D_3 - 239$ | |
| 2527.608 | 25 | - | MF | 39551.21 | $a^3F_3 - A235$ | |
| 2527.352 | 5 | 4 | MIT | 39555.21 | $a^5D_0 - E243$ | |
| 2526.828 | 50 | 20 | MIT | 39563.41 | $a^5D_4 - A231$ | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman Effect g_1 g_2 |
|-----------|-----|-----|-------|----------|---------------------|------------------------------|
| 2525.932 | 8 | 2wh | MIT | 39577.45 | $a^5F_4 - x^3D_3^o$ | |
| 2526.632 | 30 | - | MIT | 39582.15 | $a^3F_2 - A242$ | |
| 2525.174 | 30 | - | MIT | 39589.33 | $a^5D_3 - 240$ | |
| 2522.320 | 12 | 2 | MIT | 39634.12 | $a^5P_3 - 241$ | |
| 2521.613 | 60 | 1 | MIT | 39645.23 | $b^3F_4 - A242$ | |
| 2520.366 | 4 | - | MF | 39664.84 | $a^5F_3 - w^3D_2^o$ | |
| 2517.616 | 50 | - | MIT | 39708.17 | $a^5D_2 - A242$ | |
| 2516.779 | 12 | - | MF | 39721.37 | $a^5D_2 - 243$ | |
| 2516.742 | 12 | - | MF | 39721.96 | $a^5P_3 - A241$ | |
| 2516.352 | 15 | - | MF | 39728.11 | $a^3F_4 - 225$ | |
| 2515.285 | 60 | 2 | MIT | 39744.96 | $a^5P_2 - B235$ | |
| 2514.882 | 25 | 0 | MF | 39751.33 | $a^5F_4 - A181$ | |
| 2514.460 | 100 | 1 | MF | 39758.00 | $a^5F_4 - z^1F_3^o$ | |
| 2513.995 | 20 | - | MF | 39765.36 | $a^5P_2 - 236$ | |
| 2513.172 | 25 | - | MF | 39778.38 | $a^5D_4 - 233$ | |
| 2512.806 | 80 | 2 | MIT | 39784.17 | $a^3F_3 - A237$ | |
| 2512.481 | 4 | 8wh | MIT | 39789.32 | $a^5F_3 - w^3D_3^o$ | |
| 2510.971 | 20 | - | MIT | 39813.25 | $b^3F_4 - A243$ | |
| 2510.515 | 15 | - | MF | 39820.47 | $a^5F_2 - x^3F_2^o$ | |
| 2510.139 | 30 | - | MIT | 39826.44 | $a^5P_3 - B242$ | |
| 2509.597 | 20 | - | MF | 39835.04 | $a^5P_1 - F243$ | |
| 2509.069 | 50 | 20 | MIT | 39843.42 | $b^3F_4 - D243$ | |
| 2508.306 | 100 | 5 | MF | 39855.54 | $a^3F_4 - 226$ | |
| 2508.267 | 50 | 2 | MIT | 39856.16 | $a^5D_4 - 234$ | |
| 2505.097 | 10 | - | MF | 39906.59 | $a^5D_2 - D243$ | |
| 2504.526 | 25 | - | MF | 39915.69 | $a^5F_3 - x^3D_2^o$ | |
| 2504.411 | 25 | - | MF | 39917.52 | $a^5D_3 - A241$ | |
| 2502.873 | 25 | - | MF | 39942.05 | $a^3P_1 - 246?$ | |
| 2502.377 | 20 | 4h | MIT | 39949.97 | $a^3F_4 - A226$ | |
| 2501.888 | 30 | 30 | MIT | 39957.77 | $a^3F_2 - B243$ | (1.089) 1.029n |
| 2500.838 | 30 | - | MIT | 39974.55 | $a^5D_1 - E243$ | |
| 2499.563 | 4 | 3 | MIT | 39994.94 | $a^5P_3 - A242$ | |
| 2499.537 | 7 | - | MF | 39995.35 | $a^5D_3 - 242$ | |
| 2497.874 | 20 | - | MF | 40021.98 | $a^5D_3 - B242$ | |
| 2497.678 | 50 | 1h | MIT | 40025.12 | $a^3F_3 - 239$ | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman Effect | |
|-----------|-----|-----|-------|----------|-------------------|---------------|-------|
| | | | | | | g_1 | g_2 |
| 2494.923 | 10 | - | MF | 40069.31 | $a^5F_4 - w^3F_3$ | | |
| 2494.022 | 80 | - | MIT | 40083.79 | $a^5D_2 - B243$ | | |
| 2491.712 | 25 | - | MF | 40120.95 | $a^5P_2 - 240$ | | |
| 2489.912 | 60 | - | MIT | 40149.95 | $a^3F_4 - w^3F_4$ | | |
| 2489.776 | 125 | - | MF | 40152.14 | $a^5D_4 - A235$ | | |
| | | | | or | $a^3P_2 - C244$ | | |
| 2487.405 | 60 | - | MF | 40190.41 | $a^5D_3 - A242$ | | |
| 2486.738 | 20 | - | MF | 40201.19 | $a^3F_4 - w^3F_3$ | | |
| 2486.586 | 20 | - | MF | 40203.65 | $a^5D_3 - 243$ | | |
| 2483.395 | 20 | - | MF | 40255.30 | $a^5F_3 - w^3F_4$ | | |
| 2482.083 | 40 | - | MF | 40276.58 | $a^5F_5 - z^1G_4$ | | |
| 2481.565 | 20 | - | MF | 40284.98 | $a^5F_2 - y^1F_3$ | | |
| 2480.302 | 60 | - | MF | 40305.50 | $a^5D_4 - B235$ | | |
| 2479.359 | 20 | - | MIT | 40320.83 | $a^3F_3 - 241$ | | |
| 2477.550 | 12 | - | MF | 40350.27 | $a^5P_1 - E244$ | | |
| 2477.046 | 12 | - | MF | 40358.47 | $a^5D_3 - A243$ | | |
| 2476.876 | 60 | 2 | MIT | 40361.24 | $a^5P_2 - 241$ | | |
| 2476.308 | 50 | - | MIT | 40370.50 | $a^5P_3 - B243$ | | |
| 2475.564 | 2 | - | MF | 40382.63 | $a^5D_1 - F243$ | | |
| 2475.406 | 100 | 3 | MIT | 40385.21 | $a^5D_4 - A237$ | | |
| 2475.191 | 2 | - | MF | 40388.72 | $a^5D_3 - D243$ | | |
| 2474.407 | 12 | - | MIT | 40401.51 | $a^3F_4 - 231$ | | |
| 2474.036 | 50 | lwh | MIT | 40407.57 | $a^5P_1 - D244$ | | |
| 2472.099 | 40 | - | MF | 40439.23 | $a^5F_5 - y^3G_4$ | | |
| 2471.487 | 30 | - | MIT | 40449.24 | $a^5P_2 - A241$ | | |
| 2469.215 | 6 | 5h | MIT | 40486.46 | $a^3F_3 - 242?$ | | |
| 2468.303 | 20 | - | MF | 40501.42 | $a^3F_4 - A231$ | | |
| 2467.578 | 30 | - | MIT | 40513.32 | $a^3F_3 - B242$ | | |
| 2466.736 | 3 | - | MF | 40527.15 | $a^5P_2 - 242$ | | |
| 2465.757 | 15 | - | MF | 40543.23 | $a^5P_1 - A244$ | | |
| 2464.699 | 50 | 4 | MIT | 40560.64 | $a^5P_2 - C242$ | | |
| 2464.365 | 12 | - | MIT | 40566.13 | $a^5D_3 - B243$ | | |
| 2462.937 | 60 | - | MIT | 40589.65 | $a^5D_3 - C243$ | | |
| 2460.717 | 20 | 5 | MIT | 40626.26 | $a^5D_4 - 239$ | | |
| 2458.621 | 60 | 2 | MIT | 40660.90 | $a^5D_4 - A239$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman Effect g_1 g_2 |
|-----------|-----|-----|-------|----------|----------|------------------------------|
| 2457.995 | 8 | 2h | MIT | 40671.25 | a^5D_0 | - A244 |
| 2457.181 | 10 | 12 | MIT | 40684.73 | a^5P_3 | - F243 |
| 2456.283 | 25 | - | MF | 40699.60 | a^5D_0 | - F244 |
| 2454.923 | 60 | 5 | MIT | 40722.14 | a^5P_2 | - A242 |
| 2450.584 | 10 | - | MIT | 40794.24 | a^3F_4 | - 234 |
| 2450.364 | 25 | - | MF | 40797.90 | a^5F_1 | - $z^1D_2^o$ |
| 2447.451 | 30 | - | MIT | 40846.46 | a^5D_0 | - G244 |
| 2447.258 | 20 | 1 | MF | 40849.68 | a^3F_3 | - A243 |
| 2445.433 | 25 | - | MF | 40880.09 | a^5D_3 | - F243 |
| | | | | or | a^3F_3 | - D243 |
| 2444.831 | 60 | - | MF | 40890.23 | a^5P_2 | - A243 |
| 2444.387 | 100 | - | MF | 40897.65 | a^5D_1 | - E244 |
| 2443.475 | 7 | - | MF | 40912.92 | a^5D_2 | - E244 |
| 2442.939 | 40 | - | MF | 40921.89 | a^5D_4 | - 241 |
| 2441.743 | 6 | - | MIT | 40941.93 | a^5F_5 | - A181 |
| 2440.969 | 12 | - | MIT | 40954.92 | a^5D_1 | - D244 |
| 2440.055 | 40 | - | MF | 40970.26 | a^5D_2 | - D244 |
| 2439.413 | 12 | - | MF | 40981.04 | a^3F_4 | - C235 |
| 2437.788 | 40 | - | MF | 41008.35 | a^3F_2 | - F244 |
| 2437.084 | 20 | - | MF | 41020.20 | a^5D_4 | - B241 |
| 2434.882 | 50 | - | MIT | 41057.29 | a^3F_3 | - B243 |
| 2433.488 | 60 | - | MF | 41080.81 | a^3F_3 | - C243 |
| 2433.075 | 40 | - | MF | 41087.78 | a^5D_4 | - 242 |
| 2432.927 | 60 | - | MIT | 41090.58 | a^5D_1 | - A244 |
| 2432.068 | 3 | - | MF | 41104.79 | a^3P_2 | - 246 |
| 2431.992 | 25 | - | MF | 41106.08 | a^5D_2 | - A244 |
| 2431.506 | 40 | - | MF | 41114.29 | a^5D_4 | - B242 |
| 2431.221 | 3 | - | MF | 41119.11 | a^5D_1 | - F244 |
| 2430.628 | 12 | - | MF | 41129.14 | a^5F_1 | - $x^3P_2^o$ |
| 2427.741 | 2 | 12 | MIT | 41178.05 | a^5P_3 | - 244 |
| 2426.707 | 12 | 5 | MIT | 41195.59 | a^5F_1 | - $x^3P_1^o$ |
| 2423.880 | 100 | - | MF | 41243.64 | a^3F_4 | - B235 |
| 2423.092 | 8 | - | MIT | 41257.05 | a^5P_3 | - D244 |
| 2422.766 | 15 | - | MF | 41262.60 | a^5F_2 | - 204 |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman g_1 | Effect g_2 |
|-----------|-----|-----|-------|----------|---|-----------------|-----------------|
| 2422.571 | 50 | 1h | MIT | 41265.92 | a^5D_1 - G244 | | |
| 2422.177 | 12 | 8wh | MIT | 41272.63 | a^3F_4 - 237 | | |
| 2419.207 | 60 | - | MF | 41323.30 | a^3F_4 - A237 | | |
| 2416.256 | 20 | - | MF | 41373.76 | a^5D_3 - 244 | | |
| 2415.009 | 25 | - | MF | 41395.12 | a^5D_3 - E244 | | |
| 2411.769 | 25 | - | MF | 41450.73 | a^5D_4 - A243 | | |
| 2411.354 | 2 | - | MF | 41457.86 | a^3F_4 - 238 | | |
| 2407.661 | 25 | - | MF | 41521.45 | a^5F_2 - $x^3P_2^o$ | | |
| 2405.182 | 12 | 2 | MIT | 41564.24 | a^3F_4 - 239 | | |
| 2403.804 | 15 | - | MF | 41588.06 | a^5D_3 - A244 or a^5F_2 - $x^3P_1^o$ | | |
| 2403.566 | 15 | - | MF | 41592.18 | a^3F_2 - C244 | | |
| 2403.176 | 8 | - | MIT | 41598.93 | a^3F_4 - A239 | | |
| 2399.750 | 12 | - | MIT | 41658.32 | a^5D_4 - B243 | | |
| 2398.395 | 20 | - | MF | 41681.85 | a^5D_4 - C243 | | |
| 2397.185 | 2 | - | MF | 41702.89 | a^5D_1 - C244 | | |
| 2395.726 | 100 | - | MF | 41728.28 | a^5F_2 - $x^3G_3^o$ | | |
| 2395.094 | 2 | - | MF | 41739.29 | a^5F_5 - $x^3G_5^o$ | | |
| 2393.253 | 80 | 1 | MIT | 41771.32 | a^5F_3 - $y^5G_4^o$ | | |
| 2392.424 | 80 | 6 | MIT | 41785.87 | a^5F_1 - $y^5G_2^o$ | 0.005 | 0.388 |
| 2391.176 | 6 | 3 | MIT | 41807.68 | a^5F_4 - $y^1F_3^o$ | | |
| 2388.189 | 20 | 8 | MIT | 41859.96 | a^3F_4 - 241 | | |
| 2387.900 | 60 | 3 | MIT | 41865.03 | a^3F_3 - 244 | | |
| 2386.678 | 8 | 1 | MIT | 41886.46 | a^3F_3 - E244 | | |
| 2383.179 | 3 | - | MF | 41947.95 | a^3F_4 - A241 | | |
| 2382.589 | 2 | - | MF | 41958.34 | a^3F_4 - B241 | | |
| 2378.773 | 10 | - | MF | 42025.64 | a^3F_4 - 242 | | |
| 2377.262 | 33 | - | MF | 42052.35 | a^3F_4 - B242 | | |
| 2375.271 | 80 | 5 | MIT | 42087.60 | a^5F_2 - $y^5G_3^o$ | | |
| 2372.141 | 15 | - | MF | 42143.12 | a^5F_3 - $x^3P_2^o$ | | |
| 2370.173 | 60 | - | MIT | 42178.11 | a^5F_2 - $y^5G_2^o$ | | |
| 2367.775 | 4 | - | MIT | 42220.83 | a^3F_4 - A242 | | |
| 2360.724 | 8 | 2 | MIT | 42346.92 | a^5F_5 - $w^3F_4^o$ | | |
| 2360.555 | 30 | - | MIT | 42349.96 | a^5F_3 - $x^3G_3^o$ | | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman Effect g_1 g_2 |
|-----------|-----|-----|-------|----------|-------------------|------------------------------|
| 2360.097 | 20 | - | MIT | 42358.17 | $a^5F_2 - w^5D_3$ | |
| 2354.100 | 4 | 1 | MIT | 42466.07 | $a^5D_4 - 244$ | |
| 2352.842 | 10 | - | MF | 42488.77 | $a^5F_2 - x^5F_3$ | |
| 2351.334 | 60 | 4 | MIT | 42516.12 | $a^5F_3 - x^5F_4$ | |
| 2349.763 | 2 | - | MF | 42544.44 | $a^3F_2 - 246$ | |
| 2349.336 | 60 | 4 | MIT | 42552.17 | $a^5F_4 - y^5G_5$ | |
| 2348.327 | 50 | - | MF | 42570.46 | $a^5F_3 - w^3G_4$ | |
| 2344.534 | 5 | 1 | MIT | 42639.32 | $a^5D_4 - B244$ | |
| 2342.72 | 60 | 10 | MF | 42672.33 | $a^5F_4 - y^5G_4$ | |
| 2340.691 | 60 | 4 | MIT | 42708.99 | $a^5F_3 - y^5G_3$ | |
| 2339.49 | 20 | - | MF | 42731.24 | $a^5F_3 - 211$ | |
| 2337.779 | 7 | - | MF | 42762.51 | $a^5F_2 - u^3D_3$ | |
| 2336.565 | 3 | - | MF | 42784.73 | $a^5D_3 - 245$ | |
| 2335.74 | 12 | - | MF | 42799.84 | $a^5F_3 - y^5G_2$ | |
| 2334.768 | 2 | - | MF | 42817.66 | $a^5F_1 - u^3D_2$ | |
| 2333.758 | 6 | - | MF | 42836.19 | $a^5F_2 - w^3G_3$ | |
| 2327.532 | 10 | - | A | 42950.76 | $a^5F_1 - u^3D_1$ | |
| 2325.956 | 30 | - | A | 42979.86 | $a^5F_3 - w^5D_3$ | |
| 2322.012 | 60 | 2 | A | 43052.85 | $a^5F_4 - w^5D_4$ | |
| 2320.701 | 50 | - | MIT | 43077.17 | $a^5F_2 - w^5D_2$ | |
| 2320.230 | 20 | - | A | 43085.92 | $a^5F_1 - w^5D_1$ | |
| 2318.911 | 40 | - | MF | 43110.42 | $a^5F_3 - x^5F_3$ | |
| 2316.626 | 4 | - | MF | 43152.94 | $a^5D_3 - 246$ | |
| 2313.566 | 6 | - | MF | 43210.01 | $a^5F_2 - u^3D_2$ | |
| 2310.028 | tr | - | MF | 43276.18 | $a^3F_3 - 245$ | |
| 2302.541 | 80 | 3 | MIT | 43416.88 | $a^5F_4 - x^5F_4$ | |
| 2302.233 | 8 | - | A | 43422.69 | $a^5F_1 - 227$ | |
| 2300.367 | 50 | - | A | 43457.91 | $a^5F_3 - w^3G_3$ | |
| 2299.29 | 50 | - | A | 43478.27 | $a^5F_2 - w^5D_1$ | |
| 2294.058 | 60 | - | MF | 43577.42 | $a^3F_4 - B244$ | |
| 2292.337 | 20 | - | MIT | 43610.17 | $a^5F_4 - y^5G_3$ | |
| 2291.177 | 60 | 1 | MIT | 43632.21 | $a^5F_4 - 211$ | |
| 2287.68 | 60 | 1 | A | 43698.90 | $a^5F_3 - w^5D_2$ | |
| 2285.380 | 80 | 1 | MIT | 43742.87 | $a^5F_5 - y^5G_5$ | |
| 2280.741 | tr | - | MF | 43831.84 | $a^5F_3 - u^3D_2$ | |

| λ | Arc | Spk | Auth. | σ | Comb. | Zeeman Effect | |
|-----------|-----|-----|-------|----------|----------|---------------|------------------|
| | | | | | | g_1 | g_2 |
| 2278.393 | 3 | - | MF | 43877.00 | a^5D_4 | - | 245 |
| 2278.19 | 80 | - | A | 43880.91 | a^5F_4 | - | $w^5D_3^{\circ}$ |
| 2273.278 | tr | - | MF | 43975.72 | a^5F_3 | - | 222 |
| 2272.089 | 100 | 3 | MIT | 43998.79 | a^5F_5 | - | $y^5G_6^{\circ}$ |
| 2271.436 | 4 | - | MF | 44011.38 | a^5F_4 | - | $x^5F_3^{\circ}$ |
| 2270.311 | 5 | - | MF | 44033.18 | a^5F_2 | - | $w^3F_3^{\circ}$ |
| 2267.366 | 6 | - | MF | 44090.37 | a^5F_2 | - | 230 |
| 2264.686 | 10 | - | MF | 44142.54 | a^5F_1 | - | $w^3F_2^{\circ}$ |
| 2263.066 | tr | - | MF | 44174.14 | a^5F_4 | - | A214 |
| 2262.278 | 40 | - | A | 44181.71 | a^5F_3 | - | 225 |
| 2259.515 | 150 | - | MF | 44243.55 | a^5F_5 | - | $w^5D_4^{\circ}$ |
| 2256.170 | 15 | - | MF | 44309.14 | a^5F_3 | - | 226 |
| 2255.521 | 80 | 3 | MIT | 44321.89 | a^5F_5 | - | $x^5F_5^{\circ}$ |
| 2254.946 | 10 | - | MF | 44333.19 | a^5F_2 | - | A231 |
| 2254.701 | 25 | - | MF | 44338.01 | a^5F_4 | - | 216 |
| 2253.64 | 50 | - | MF | 44358.88 | a^5F_4 | - | $w^3G_3^{\circ}$ |
| 2249.43 | 8 | - | MF | 44441.89 | a^5F_1 | - | D235 |
| 2246.911 | 2 | - | MF | 44491.71 | a^5F_5 | - | C208 |
| 2243.220 | 20 | 1 | MIT | 44564.91 | a^5F_4 | - | $w^3G_5^{\circ}$ |
| 2241.278 | 2 | - | MF | 44603.52 | a^5F_3 | - | $w^3F_4^{\circ}$ |
| 2241.07 | 60 | - | MF | 44607.66 | a^5F_5 | - | $x^5F_4^{\circ}$ |
| 2240.138 | 2 | - | MF | 44626.22 | a^5F_2 | - | 234 |
| 2239.85 | 8 | - | A | 44631.95 | a^5F_2 | - | 235 |
| 2238.701 | 4 | - | MF | 44654.86 | a^5F_3 | - | $w^3F_3^{\circ}$ |
| 2236.256 | 5 | - | MF | 44703.68 | a^5F_1 | - | 236 |
| 2235.84 | 12 | - | A | 44712.00 | a^5F_3 | - | 230 |
| 2230.804 | 8 | 2 | MIT | 44812.92 | a^5F_2 | - | C235 |
| 2230.687 | 3 | - | MF | 44815.27 | a^3F_4 | - | 245 |
| 2230.31 | 30 | - | A | 44822.84 | a^5F_5 | - | 211 |
| 2229.747 | 2 | - | MF | 44834.17 | a^5F_2 | - | D235 |
| 2228.703 | 7 | - | MF | 44855.16 | a^5F_3 | - | 231 |
| 2227.64 | 30 | - | A | 44876.52 | a^5F_4 | - | 222 |
| 2223.750 | 3 | - | MF | 44955.06 | a^5F_3 | - | A231 |
| 2217.455 | 3 | - | MF | 45082.66 | a^5F_4 | - | 225 |
| 2216.801 | 2 | - | MF | 45095.96 | a^5F_1 | - | 236 |

| <u>λ</u> | <u>Arc</u> | <u>Spk</u> | <u>Auth.</u> | <u>σ</u> | <u>Comb.</u> | <u>Zeeman</u> g_1 | <u>Effect</u> g_2 |
|-----------------------------|------------|------------|--------------|----------------------------|-----------------------|------------------------|------------------------|
| 2211.210 | 5 | - | MF | 45209.98 | a^5F_4 - 226 | | |
| 2209.359 | 3 | - | MF | 45247.84 | a^5F_3 - 234 | | |
| 2209.074 | 10 | - | MIT | 45253.68 | a^5F_3 - 235 | | |
| 2203.658 | 7 | - | MF | 45364.89 | a^5F_5 - A214 | | |
| 2200.28 | 8 | - | A | 45434.53 | a^5F_3 - C235 | | |
| 2199.451 | 4 | - | MF | 45451.65 | a^5F_1 - 240 | | |
| 2196.904 | 12 | - | MF | 45504.34 | a^5F_4 - $w^3F_4^o$ | | |
| 2195.73 | 12 | - | A | 45528.67 | a^5F_5 - 216 | | |
| 2187.629 | 3 | - | MF | 45697.25 | a^5F_3 - B235 | | |
| 2186.242 | tr | - | MF | 45726.24 | a^5F_3 - 237 | | |
| 2184.830 | 5 | - | MF | 45755.79 | a^5F_4 - 231 | | |
| | | | | or | a^5F_5 - $w^3G_5^o$ | | |
| 2183.823 | 6 | - | MF | 45776.88 | a^5F_3 - A237 | | |
| 2183.686 | 10 | - | MF | 45779.76 | a^5F_2 - A241 | | |
| 2180.055 | 3 | - | MF | 45855.99 | a^5F_4 - A231 | | |
| 2178.386 | 3 | - | MF | 45891.12 | a^5F_2 - C242 | | |
| 2177.419 | 10 | - | MF | 45911.50 | a^5F_3 - 238 | | |
| 2175.973 | 7 | - | MF | 45942.00 | a^5F_1 - E243 | | |
| 2174.804 | 7 | - | MF | 45966.70 | a^5F_4 - B231 | | |
| 2172.386 | 5 | - | MF | 46017.86 | a^5F_3 - 239 | | |
| 2170.126 | 7 | - | MF | 46065.77 | a^5F_2 - 243 | | |
| 2170.060 | 7 | - | MF | 46067.17 | a^5F_5 - 222 | | |
| 2169.773 | 12 | - | MF | 46073.27 | a^5F_3 - 240 | | |
| 2166.226 | 12 | - | MF | 46148.70 | a^5F_4 - 234 | | |
| 2162.855 | 2 | - | MF | 46220.62 | a^5F_2 - A243 | | |
| 2160.400 | 12 | - | MF | 46273.13 | a^5F_5 - 225 | | |
| 2158.515 | 2 | - | MF | 46313.54 | a^5F_3 - 241 | | |
| 2157.548 | 6 | - | MF | 46334.29 | a^5F_2 - E243 | | |
| 2152.419 | 15 | - | MF | 46444.69 | a^5F_4 - A235 | | |
| 2150.819 | 10 | H | MF | 46479.24 | a^5F_3 - 242 | | |
| 2150.088 | 6 | - | MF | 46495.04 | a^5F_5 - A226 | | |
| 2149.586 | 7 | - | MF | 46505.89 | a^5F_3 - B242 | | |
| 2145.337 | 7 | - | MF | 46597.99 | a^5F_4 - B235 | | |
| 2144.000 | 15 | - | MF | 46627.05 | a^5F_4 - 237 | | |
| 2140.88 | 12 | - | A | 46694.99 | a^5F_5 - $w^3F_4^o$ | | |

| <u>λ</u> | <u>Arc</u> | <u>Spk</u> | <u>Auth.</u> | <u>σ</u> | <u>Comb.</u> | <u>Zeeman</u> <u>g_1</u> | <u>Effect</u> <u>g_2</u> |
|-----------------------------|------------|------------|--------------|----------------------------|-----------------|--|--|
| 2135.510 | 3 | - | MF | 46812.40 | a^5F_4 - 238 | | |
| 2134.146 | tr | - | MF | 46842.29 | a^5F_3 - A243 | | |
| 2133.114 | 4 | - | MF | 46864.97 | a^5F_1 - E244 | | |
| 2130.672 | 4 | - | MF | 46918.68 | a^5F_4 - 239 | | |
| 2129.103 | 10 | - | MF | 46953.25 | a^5F_4 - A239 | | |
| 2124.73 | 4 | - | A | 47049.87 | a^5F_3 - B243 | | |
| 2123.67 | 4 | - | A | 47073.36 | a^5F_3 - C243 | | |
| 2115.21 | 3 | - | A | 47261.61 | a^5F_5 - 233 | | |
| 2109.915 | 3 | - | MF | 47380.20 | a^5F_4 - 242 | | |
| 2105.53 | 2 | - | A | 47478.86 | a^5F_2 - F244 | | |
| 2090.60 | 4 | - | A | 47817.89 | a^5F_5 - 237 | | |
| 2088.86 | 2 | - | A | 47857.71 | a^5F_3 - 244 | | |
| 2085.427 | 3 | - | MF | 47936.48 | a^5F_3 - D244 | | |
| 2076.43 | 4 | - | A | 48144.16 | a^5F_5 - A239 | | |
| 2059.84 | 2 | - | A | 48531.86 | a^5F_5 - B241 | | |
| 2050.259 | 2 | - | MF | 48758.63 | a^5F_4 - 244 | | |
| 2029.022 | tr | - | MF | 49268.89 | a^5F_3 - 245 | | |
| 2013.981 | tr | - | MF | 49636.79 | a^5F_3 - 246 | | |

Supplement to Table IX

| <u>λ</u> | <u>Arc</u> | <u>Spk</u> | <u>Auth.</u> | <u>σ</u> | <u>Comb.</u> | <u>Zeeman</u> <u>g_1</u> | <u>Effect</u> <u>g_2</u> |
|-----------------------------|------------|------------|--------------|----------------------------|------------------------|--|--|
| 6982.02 | 125 | - | MF | 14318.56 | $z^5D_3^0 - A43$ | | |
| 6824.09 | 200 | - | MIT | 14649.93 | $z^5D_2^0 - A43$ | | |
| | | | | | or $z^5F_1^0 - e^5F_1$ | | |
| 6766.95 | 30 | - | MIT | 14773.64 | $z^5D_0^0 - e^5F_1$ | | |
| 6702.053 | 3 | - | MF | 14916.69 | $z^5F_2^0 - e^5F_1$ | | |
| 6296.216 | 15 | - | MIT | 15878.17 | $z^5D_2^0 - e^5F_1$ | | |
| 6006.946 | tr | - | MF | 16642.80 | $z^7D_2^0 - 46$ | | |
| 5692.117 | 2 | - | MF | 17563.31 | $z^7D_1^0 - e^5F_1$ | | |
| 5454.816 | 100 | - | MIT | 18327.34 | $z^5S_2^0 - 56$ | | |
| 3516.186 | 3 | - | MIT | 28431.81 | $a^3H_4 - 216$ | | |
| 3405.133 | 10 | - | MF | 29359.04 | $a^3D_3 - w^3G_3$ | | |
| 2570.086 | 10 | - | MIT | 38897.56 | $a^5F_5 - z^3H_6^0$ | | |