JAERI-M
86-081

Mo XV-XLの原子構造の計算

1986年6月

久保　博孝・石井　慶之*・杉江　達夫
志甫　　諒・前田　彦祐・鈴木　康夫

日本原子力研究所
Japan Atomic Energy Research Institute

JAERI-Mレポートは，日本原子力研究所が不定期に公刊している研究報告書です。
入手の問合わせは，日本原子力研究所技術情報部情報資料課（〒319-11茨城県那珂郡東海村）あて，お申しこしください。なお，このほかに財団法人原子力弘済会資料センター（〒319-11 茨城県那珂郡東海村日本原子力研究所内）で複写による実費頒布をおこなっております。

JAERI-M reports are issued irregularly.
Inquiries about availability of the reports should be addressed to Information Division Department of Technical Information, Japan Atomic Energy Research Institute, Tokai-mura, Naka-gun, Ibaraki-ken 319-11, Japan.

編集兼発行　日本原子力研究所
印　　刷　いばらき印刷㈱

Mo XV～XL の原子構造の計算

日本原子力研究所那珂研究所臨界プラズマ研究部
久保博孝・石井慶之*・杉江達夫・志甫　諒・前田彦祐+
鈴木康夫

（1986年5月8日受理）

核融合プラズマにおける不純物問題の解明の為には，高電離重イオンの衝突・輻射に関する基礎データが必要である。本論文では，Mo XV～XL の原子構造とそれに基づくスペクトルの計算を行った。計算にはCowan のプログラムを利用した。実験によって知られているデータを基に，Hartree－XR 法によって得られたスレーターパラメーターの値をスケーリングする事により，経験的に計算を行った。Mo XV～XL の基底電子配置への遷移に伴うスペクトルを中心に，波長・遷移確率及びエネルギー準位を表に示す。又，スペクトルの同定及び原子構造の理解に利用できる様，波長と遷移確率の関係，エネルギー準位を図として表現した。

那珂研究所：〒311－02　茨城県那珂郡那珂町大字向山801－1
+　核融合研究部
*　京都大学工学部物理工学科

JAERI-M 86-081

Atomic Structure Calculations of Mo XV-XL

Hirotaka KUBO, Keishi ISHII*, Tatsuo SUGIE,
Makoto SHIHO, Hikosuke MAEDA+, Yasuo SUZUKI

Department of Large Tokamak Research,
Naka Fusion Research Establishment
Japan Atomic Energy Research Institute
Naka-machi, Naka-gun, Ibaraki-ken

(Received May 8, 1986)

Energy levels and oscillator strengths were calculated for Mo XV - Mo XL. The computer program for atomic structure calculation, developed by Dr. Robert D. Cowan, Los Alamos National Laboratory, was used in the present work. The scaled energy parameters were empirically determined from the observed spectral data. We present wavelengths and transition probabilities of Mo XV-XL. Energy levels and spectral patterns are presented in figures that are useful for the identification of spectral lines.

Keywords: Atomic Structure, Impurity, Plasma, Numerical Solution, Energy-Level, Transition, Oscillator Strength, Molybdenum Spectra

+ Department of the Thermonuclear Fusion Research

* Department of Engineering Science, Kyoto University

目　　次

Contents

1. 序

核融合プラズマ中の不純物の挙動解析には，不純物の高電離イオンからのスペクトルについての知識が必須である。特に，分光測定のデータを解析する事は，まずスペクトルを正しく同定する事から始まる。JT－60のリミターは，チタン・カーバイトの膜で被われたモリブデンが用いられているが，そのモリブデンのプラズマへの混入の様子を解析する為には，その高電離状態からの輻射を取扱わなければならない。例えば，コロナ平衡で考えると0.5 keVの温度で15価以上の電離が期待され，10 keVではヘリウム型のイオン状態[1]が考えられる。しかしながら，一般に小規模光源では，その様な高電離状態を作る事の困難さから，スペクトルのデータも非常に限られている。又，理論的な計算も相対論の効果が強くなる中で複雑な電子配置に対する計算は困難となる。

モリブデンの高電離イオンのスペクトルは真空スパークやレーザー照射によって作られたプラズマ及びトカマクプラズマなどで観測されている。Mo XV，XVI，XXXI，XXXII，XXXIII，XXXIVの様に比較的簡単なスペクトルを持つイオン化状態がまず調べられている。その他に電離度が上がる順に挙げていくと，Mo XVII，XVIII，XVIIIについては$3p^6\ 3d^N - 3p^5\ 3d^{N+1}$の遷移に伴う複雑なスペクトルが固定されている。Mo XIX，XX，XXI，XXIIについてはスペクトルが更に複雑となる事もあり，スペクトル線としては一本も同定されていない。Mo XXIII，XXIV，XXVについては，比較的簡単な系であるが同定されたスペクトルは少ない。Mo XXVI，XXVII，XXVIII，XXIXについては，許容遷移によるスペクトルは全く同定されていず，基底電子配置$3p^N$間の磁気双極子輻射による禁制線がトカマクで同定されているに留まる。Mo XXXについては，$3s^{2-N}3p^{1+N}$間のスペクトルが比較的よく同定されている。Mo XXXV以上の高電離については，Mo XL，XLI，XLIIでいくつかのスペクトルが同定されているにすぎない。モリブデンのスペクトルについての文献[2]及び数値データ[3]は，日本原子力研究所核データセンターでまとめられている。

次に理論計算の概要について述べる。高電離のモリブデンイオンの計算では，相対論的補正を含むHartree－XR法（HXR）[4]やRelativistic Parametric Potentialの方法（RPP）[5]が広く用いられている。又，L殻を最外殻電子とする32価以上の電離状態の内，特に簡単な系については，相対論的な補正を含むMulti Configurational Hartree－Fock法（MCHF）[6]やDirac－Fock法（DF）[7]の様に更に丁寧な計算が行われている。しかしながら，一般にどの理論であっても理論から直接導びかれた（ab initioの）結果は，系が簡単な場合を除いては，実験結果を正しく予言するほどの高精度は期待できない。その為，Mo XVI[8)9)10)]，XVII[11)12)13)]，XVIII[14)]などではHartree－Fock法（HF）で得たスレーター積分の値を，実験値が再現する様にフィッティングする方法が採用されている。同様の事がMo XXVI～XXIXの基底状態$3p^N$の電子配置について行われている[15)]。

本論文では，HXR[16)]によってab initioに計算したエネルギー・パラメーター（電子配置の平均エネルギー；E_{av}，スレイター積分値；F，G，スピン軌道相互作用；ζ，電子配置間のク－

ロン相互作用；R）を実験値にあう様にスケーリングするという観点で，今までの実験値をisonuclear sequence に沿って調べ，それより得られたスケーリングの係数を利用する事により観測されていない電離状態からのスペクトルを計算した。この様なスケーリングの方法は，Fawcett[17)18)19)] により鉄族の元素について，isoelectronic sequence に沿って，多くの計算がなされている。我々はn＝2，3に価電子を持つイオンを取扱った。それらのイオンの電離エネルギーは，540eV～5.6keV の範囲にある。この様に高いエネルギーを要するので，実験により同定されたスペクトルが数少ない。従って，鉄族の様に詳しいスケーリングはできない。しかしながら，実験において新しいスペクトルを同定する為に十分役立つ計算ができたと考えている。特に，波長，遷移確率，エネルギーの表の他に添えた，エネルギーレベルの図及び波長と重みつきの遷移確率（gA）の関係を表した図は，イオンの構造の理解及びスペクトルのパターンによる同定の為の第一歩目のデータとして利用しやすくなっている。Mo XVI，XVII，XVIIIの様に，すでにこの様な半径験的に解析が行われたデータも引用し，図示した。

2. 計算の方法

計算の方法は，1）HXR法によるab initio の計算，2）実験で知られているスペクトルについて，エネルギーパラメーターをスケーリングする事によりそれを再現し，観測されていないイオンについては，スケーリングを適当に行うという2つの部分に分かれる。この方法の詳細については，石井による解説[20)]がある。

2.1 HXR法[16)20)]

原子構造に対するHamiltonianは

$$H = -\sum_i \nabla_i^2 - \sum \frac{2Z}{r_i} + \sum_{i>j} \frac{2}{r_{ij}} + \sum_i \xi(r_i)\ (\ell_i \cdot s_i)$$

となる。第一項は運動エネルギー，第2項は核のクーロン・ポテンシャル，第3項は電子間のクーロン・ポテンシャル，第4項はスピン軌道相互作用エネルギーを表す。ここで中心力場近似を用いて，一電子問題に一旦還元して，更に

$$\phi_{n\ell m_\ell m_s}(r, \theta, \varphi, s_z) = \frac{1}{r} P_{n\ell}(r)\, Y_{\ell m_\ell}(\theta, \varphi)\, \sigma_{m_s}(s_z)$$

の様に一電子系の波動関数を変数分離する。そうすると，

$$\left[-\frac{d^2}{dr^2} + \frac{\ell_i(\ell_i+1)}{r^2} + V_i(r)\right] P_i(r) = \varepsilon_i P_i(r)$$

の方程式を得る。この方程式で，Hartree－plus－Statistical exchange with Relativistic Correction（HXR）法による $V_i(r)$ を使い，$V_i(r)$ と $P_i(r)$ が自己無撞着（Self

ロン相互作用；R）を実験値にあう様にスケーリングするという観点で，今までの実験値をisonuclear sequence に沿って調べ，それより得られたスケーリングの係数を利用する事により観測されていない電離状態からのスペクトルを計算した。この様なスケーリングの方法は，Fawcett[17)18)19)] により鉄族の元素について，isoelectronic sequence に沿って，多くの計算がなされている。我々は$n=2$，3に価電子を持つイオンを取扱った。それらのイオンの電離エネルギーは，540eV～5.6keV の範囲にある。この様に高いエネルギーを要するので，実験により同定されたスペクトルが数少ない。従って，鉄族の様に詳しいスケーリングはできない。しかしながら，実験において新しいスペクトルを同定する為に十分役立つ計算ができたと考えている。特に，波長，遷移確率，エネルギーの表の他に添えた，エネルギーレベルの図及び波長と重みつきの遷移確率（gA）の関係を表した図は，イオンの構造の理解及びスペクトルのパターンによる同定の為の第一歩目のデータとして利用しやすくなっている。Mo XVI，XVII，XVIIIの様に，すでにこの様な半径験的に解析が行われたデータも引用し，図示した。

2. 計算の方法

計算の方法は，1）HXR法によるab initio の計算，2）実験で知られているスペクトルについて，エネルギーパラメーターをスケーリングする事によりそれを再現し，観測されていないイオンについては，スケーリングを適当に行うという2つの部分に分かれる。この方法の詳細については，石井による解説[20)]がある。

2.1 HXR法[16)20)]

原子構造に対するHamiltonianは

$$H=-\sum_i \nabla_i^2-\sum\frac{2Z}{r_i}+\sum_{i>j}\frac{2}{r_{ij}}+\sum_i \xi(r_i)\ (\ell_i\cdot s_i)$$

となる。第一項は運動エネルギー，第2項は核のクーロン・ポテンシャル，第3項は電子間のクーロン・ポテンシャル，第4項はスピン軌道相互作用エネルギーを表す。ここで中心力場近似を用いて，一電子問題に一旦還元して，更に

$$\phi_{n\ell m_\ell m_s}(r,\theta,\varphi,s_z)=\frac{1}{r}P_{n\ell}(r)\,Y_{\ell m_\ell}(\theta,\varphi)\,\sigma_{m_s}(s_z)$$

の様に一電子系の波動関数を変数分離する。そうすると，

$$\left[-\frac{d^2}{dr^2}+\frac{\ell_i(\ell_i+1)}{r^2}+V_i(r)\right]P_i(r)=\varepsilon_i P_i(r)$$

の方程式を得る。この方程式で，Hartree－plus－Statistical exchange with Relativistic Correction（HXR）法による$V_i(r)$を使い，$V_i(r)$と$P_i(r)$が自己無撞着（Self

consistent）となる様に逐次近似を行い動径波動関数$P_i(r)$を計算する。以上により得られた$P_i(r)$を利用してエネルギー行列を構築する。エネルギーの行列要素は

$$H_{ab} = E_{av}\,\delta_{ab} + \sum_{j=1}^{q}\Big[\sum_{k>0} f_k(\ell_j,\ell_j)\,F^k(\ell_j,\ell_j) + \sum_j d_j\,\zeta_j\Big] + \sum_{i=1}^{q-1}\sum_{j=i+1}^{q}\Big[\sum_{k>0} f_k(\ell_i,\ell_j)\,F^k(\ell_i,\ell_j) + \sum_{k>0} g_k(\ell_i,\ell_j)\,G^k(\ell_i,\ell_j)\Big]$$

と表現できる。E_{av}は電子配置の平均エネルギー，F^k，G^kはスレーターの直接積分と交換積分，ζ_jはスピン軌道相互作用を表わす。又，電子配置間の相互作用R^k，電子双極子輻射による遷移確率を計算する時に必要な既約双極子モーメントを計算する。エネルギー・レベル，固有関数は，まず角運動量の理論に従ってLS基底でf_k，g_kを計算し，次にエネルギー行列を対角化する事によって得られる。その時電子配置間の相互作用が大きく影響を与える場合には，それらの電子配置を含めた形でエネルギー行列を取扱う。

2.2 エネルギー・パラメーターのスケーリング

2.1によるHXR法は更に複雑なSCFの計算（例えばDF法，MCDF法）に比べ，やや大雑把である。しかしながら，いずれにしてもM殻を価電子として含む複雑な系に対して，DF法，MCDF法などの計算を行う事は収束性の問題，計算の大きさの問題があり，非現実的である。従ってHXR法の様な計算で得たab initioのエネルギー値（E_{av}，F，G，ζ）をスケーリングする事或いはフィッティングする事により，その値を利用して計算する事が有効となる。このスケーリングは，人為的に実験値を再現すべく導入された値であるが，物理的にはHXR法の近似で無視されている部分（例えば，相互作用の考慮されていない電子配置からの影響，電子相関エネルギー，高次の相対論的効果など）によるものと理解される。実際，物理的というより数学的になりつつある複雑な原子構造の解析においてはこの様なスケーリングの係数を正確に系統的に調べる事が最っとも現実性のある有効な方法である。具体的には各準位のエネルギーを実験値に近づける様にエネルギーパラメーターをスケーリングする。知られているエネルギーの数が少なくて，個々のパラメーターを一つ一つスケーリングできるほどの情報がない時には，パラメーターをグループにわけてそのグループでは同じ係数を用いるという方法が取られる。例えば，直接積分F，交換積分G，スピン軌道相互作用ζ，電子配置間相互作用Rという様にグループわけし，４つのスケーリングの係数を用いたり，もっと大雑把にスピン軌道相互作用ζ，クーロン相互作用F，G，R，という様に２つにグループわけて，２つのスケーリングの係数で取扱ったりする。これは同じ力に依存するエネルギーパラメーターは波動関数$P_i(r)$より同じ様に導き出されるという事を根拠としている。又，上述の様に適当なエネルギーパラメーターを計算に用いる事により，固有関数をよりよく表現する事（固有ベクトルを基底ベクトルの成分として表現している）ができる。従って，遷移確率の計算もより信頼できるものとなる。特に，$3d^N$或いは$3p^N\,3d$，$3s\,3p^N$の様に複雑な電子配置で，LS結合やjj結合で表現できない様な場合には，本計算の様な中間結合形式を取る事が重要である。

2.3 各 論

Mo XV～XXIVについては，Mo XVI，XVII，XVIII の実験データの解析によって得られたスケーリングの係数を基にして，エネルギーパラメータをスケーリングした。表1，表2に我々の採用したスケーリングの係数を示す。即ち，採用したエネルギー値とHXR法による値との比を示している。ΔE_{av} は励起電子配置の平均エネルギーと基底電子配置の平均エネルギーとの差を単位 kcm^{-1} で示し，表中には実際の計算に採用したエネルギー値とab initioの計算値との差を表す。Mo XVI [a] についてはNBS グループの研究[8]，Mo XVII [b]，XVIII [c] についてはWyart 他による研究[13)14)]に，エネルギーパラメーターが示されている。彼等はMo付近の元素について，isoelectronic sequence に沿って，スペクトルをフィットする事によりスケーリングの係数を求めている。Mo XV [b] には，更に ΔE_{av} をSchweitzer他[21)]の実験に合う様シフトした。

Mo XXV～XXXI については，Mo XXVI～XXX の基底状態 $3p^N$ のエネルギーレベルの実験結果を基にスケーリングを行った。$3p^N$ 間の磁気双極子遷移に伴うスペクトルは，トカマクなどで禁制線としてかなり同定されている。それについてNBS のグループは，isoelectronic sequence 及び isonuclear sequence について系統的にF，ζ及び有効エネルギー・パラメーター α を調べている。[15)] 1kK程度の精度と評価される。我々はMo XXV～XXXIのスケーリングの係数として表3に示す値を用いた。スピン軌道相互作用とクーロン相互作用に分けてスケーリングした。尚，Mo XXVI～XXXの基底の電子配置 [a] についてはNBS のグループが示したエネルギー[15)]を用いた。但し，電子配置間相互作用を含んで計算しているので α は計算には入れていない。Mo XXXの $(3d)$，$(3s)(3p)^2$ [b] については，Mansfield 他[22)]の実験値に近づける様に，ΔE_{av} をab initio の計算値より4.44kK大きな値を採用した。他のイオンについてはab initio の ΔE_{av} を用いた。

尚，計算においては主要な電子配置間の相互作用は考慮した。それは，HXR 法の計算によって得られた電子配置間のエネルギー差 ΔE_{av} とクーロン力による電子配置間の相互作用 R^k を基に評価した。結局，基底状態 $(3s)^2(3p)^N$ を含むパリティでは $(3p)^{N+2}$，$(3s)(3p)^N(3d)$，$(3s)^2(3p)^{N-2}(3d)^2$ を含んでエネルギー行列を作った。励起状態 $(3s)^2(3p)^{N-1}(3d)$ 及び $(3s)(3p)^{N+1}$ については，$(3p)^{N+1}(3d)$，$(3s)(3p)^{N-1}(3d)^2$ との相互作用を入れて計算した。この様に高電離イオンにおいては，Complex と呼ばれる電子配置（同じ主量子数に入ってる電子の数が等しい様な電子配置，言い換えれば電子同志の相互作用がなければ縮退してしまう様な電子配置）が主に相互作用する。

Mo XXXII [c] については，Mansfield 他[22)]による同定を出発点としエネルギーパラメーターを求めた。得られたスケーリングパラメーターは表3に示す。

Mo XXXIII についてもMo XXV～XXXI に準じて，F を0.90，ζを0.95にスケーリングした。計算では $(2s)^2(2p)^6$，$(2p)^5(3\ell)$，$(2s)(2p)^6(3\ell)$ の形の電子配置を取扱った。

Mo XXXIVのスケーリングの係数を表4に示す。$(2s)^2(2p)^5$ [a] はDoschek and Feldman[23)]の波長測定のデータをもとにしてζをスケーリングした。n＝3に電子を含む配置 [b] については，Boiko 他[24)]の実験データに近づける様に ΔE_{av} を85.0kK小さくした。その他の

エネルギーパラメーターはab initioの値を用いた。

Mo XXXV～XXXIXのスケーリングの係数を表4に示す。この範囲のイオンについては，実験データは全くない。そこで，我々はFawcett[19]による鉄族におけるスケーリングの係数の変化，Edlénの外挿[25]を基に，n＝2のレベルのスクーリングを決めた。n＝3の電子については，スケーリングの根拠とすべきものが知られていないので，ab initioのパラメーターを直接用いて計算した。

Mo XLについても，実験データはない。今回は，Edlénの式[26]によってパラメーターを決定した。表4に対応するスケーリングを示す。

3. 結　　果

Mo XV～XLについての計算結果をp．17～p．224に示す。一つの電離状態に対して，大まかなグロトリアン図，エネルギーレベルの図，エネルギーレベルの表，波長とgAを示した図，波長，振動子強度，遷移確率の表の5つよりなっている。但し，構造が簡単なイオンやスペクトル線の少ないイオンは図を省略した。

まず，大まかなグロトリアン図は原子構造の理解の為に役立つであろう。図はHXR法の計算による電子配置の平均エネルギーE_{av}を，偶パリティ，奇パリティに分けて表したもので，エネルギーの拡がりはその電子配置の最っとも大きいエネルギー・パラメーターを示す。従って，実際のエネルギーの拡がりを表してはおらず，大概のオーダーに対応する。下線を伴う電子配置は，取扱った電子配置に相互作用の大きいものを示す。又，図中の波長はΔE_{av}を波長に換算したもので，実際の波長分布はそれよりも短波長側で線強度が強くなる。尚，エネルギーは基底の電子配置のE_{av}を0としている。Mo XXXII，XLについては，詳しいグロトリアン図を示し，次に述べる図は省略した。

次にエネルギーレベルの図をJの数に従って表す。各準位のラベルはLS結合に従って，固有関数の主なる要素で名づけた。ただし，jj結合の方が適当と思われるMo XXXIII，XXXIV，XXXVI，XXXVIIについてはそれで表現した。又，系が複雑な場合やLS結合でもjj結合でも表現が適当でない場合にはラベルを付けなかった。

3番目にエネルギーレベルの表を示す。表はパリティで2つにわけられており，右から全角運動量J，番号づけの数，エネルギーをkKで示したもの及び固有関数の主なる要素を示す。5％以上の2つの主なる要素を表した。それは，計算機出力の便宜上$(^{2S'+1}L')^{2S+1}L$を(2S'+1，L')2S+1，Lという形に表現してある。その前にある番号は電子配置を示している。　但し，Mo XXXIII，XXXVIIについてはjj結合で表した。

4番目に波長とgA（重みつきの遷移確率）の図を示す。ここでgは上位レベルの統計的重率を示す。実際のスペクトルはgの替りに，その励起状態の数を置き換えたものである。低密度プラズマでは，基底状態からの電子衝突によって励起状態が作られ，又，励起係数は一般に振動子強度に関係する。従って，この図は実際のスペクトルにパターンとしては類似している。

5番目に波長，gA，gf（重みつきの振動強度）を示す。ここで注意しなければならないのは，

エネルギーパラメーターはab initioの値を用いた。

Mo XXXV～XXXIXのスケーリングの係数を表4に示す。この範囲のイオンについては，実験データは全くない。そこで，我々はFawcett[19]による鉄族におけるスケーリングの係数の変化，Edlénの外挿[25]を基に，n＝2のレベルのスクーリングを決めた。n＝3の電子については，スケーリングの根拠とすべきものが知られていないので，ab initio のパラメーターを直接用いて計算した。

Mo XLについても，実験データはない。今回は，Edlénの式[26]によってパラメーターを決定した。表4に対応するスケーリングを示す。

3. 結　　果

Mo XV～XLについての計算結果を p. 17～p. 224 に示す。一つの電離状態に対して，大まかなグロトリアン図，エネルギーレベルの図，エネルギーレベルの表，波長とgAを示した図，波長，振動子強度，遷移確率の表の5つよりなっている。但し，構造が簡単なイオンやスペクトル線の少ないイオンは図を省略した。

まず，大まかなグロトリアン図は原子構造の理解の為に役立つであろう。図はHXR法の計算による電子配置の平均エネルギーE_{av}を，偶パリティ，奇パリティに分けて表したもので，エネルギーの拡がりはその電子配置の最っとも大きいエネルギー・パラメーターを示す。従って，実際のエネルギーの拡がりを表してはおらず，大概のオーダーに対応する。下線を伴う電子配置は，取扱った電子配置に相互作用の大きいものを示す。又，図中の波長はΔE_{av}を波長に換算したもので，実際の波長分布はそれよりも短波長側で線強度が強くなる。尚，エネルギーは基底の電子配置のE_{av}を0としている。Mo XXXII，XLについては，詳しいグロトリアン図を示し，次に述べる図は省略した。

次にエネルギーレベルの図をJの数に従って表す。各準位のラベルはLS結合に従って，固有関数の主なる要素で名づけた。ただし，jj 結合の方が適当と思われるMo XXXIII，XXXIV，XXXVI，XXXVIIについてはそれで表現した。又，系が複雑な場合やLS結合でもjj結合でも表現が適当でない場合にはラベルを付けなかった。

3番目にエネルギーレベルの表を示す。表はパリティで2つにわけられており，右から全角運動量J，番号づけの数，エネルギーをkKで示したもの及び固有関数の主なる要素を示す。5％以上の2つの主なる要素を表した。それは，計算機出力の便宜上$(^{2S'+1}L')^{2S+1}L$を(2S'+1，L')2S+1，Lという形に表現してある。その前にある番号は電子配置を示している。　但し，Mo XXXIII，XXXVIIについてはjj結合で表した。

4番目に波長とgA（重みつきの遷移確率）の図を示す。ここでgは上位レベルの統計的重率を示す。実際のスペクトルはgの替りに，その励起状態の数を置き換えたものである。低密度プラズマでは，基底状態からの電子衝突によって励起状態が作られ，又，励起係数は一般に振動子強度に関係する。従って，この図は実際のスペクトルにパターンとしては類似している。

5番目に波長，gA，gf（重みつきの振動強度）を示す。ここで注意しなければならないのは，

gAでは上位のレベルのgを，gfでは下位のレベルのgを掛けている。エネルギー準位は，Jとエネルギーで表している。

4. 考　　察

Mo XVの計算結果と，Schweitzer 他[21]の実験による波長との比較を表5に示す。実験精度の範囲内で十分一致している。従って，HXR法によるΔE_{av}が4.5kK以内の誤差でab initioに計算できている事がわかる。

Mo XVI はNBSグループの計算[8]を再現したものであるので，エネルギーレベルについては言及しない。しかし，Burkhalter 他[27]に示されているgf の値と我々の計算結果を比較すると，15％程度大きくなっている。これは動径方向の波動関数の相違により，既約電気双極子モーメントが我々の方が小さくなっている事によるものである。しかしながら，彼等の計算については詳細は述べられていないので，相違の要因は明らかではない。

Mo XVII，XVIII もWyart 他[13) 14)]による計算を再現したものであるので，特に言及しない。但し，我々の計算では有効パラメーターTが含まれていない。しかしTによる効果は10^2 cm^{-1} のオーダーであり，現状の計算及び実験精度では問題とならない。又，振動子強度については，我々のMo XVII の計算結果は，Barkhalter他[27]の結果とよく合っていて，Mo XVIで見られた様な相違はない。

以上の様にMo XVI，XVII，XVIIIについては，すでに求っているエネルギーパラメーターを引用し，計算を再現した。我々は，HXR法の計算に基づいてデータをまとめておく事が，これからの研究に役立つであろうと考えている。又，Mo XVIII では相対線強度しか与えられていなかったが，今回はその絶対値を表に示した。

Mo XIX～XXIII については比較するデータはない。Mo XIX，XXについては，表2に示す様に電子配置の平均エネルギーをHXR法によって得られた値に0～30.5kK加えた値を採用した。これは，Mo XVI，XVII，XVIII ではHXR法による計算結果から実験より求めた結果を引いた値が，電離が進むにつれて5kKずつ小さくなっていく傾向を，Mo XIX，XXについて外挿したものである。各電子配置の構造を評価しても，Mo XIX，XXに対して，以上の様な傾向が急変するという理由は見当らない。従って，スケーリングの係数が3％程度として，0.5Å程度の誤差と考えられる。又，エネルギーレベルの表より，電子配置が複雑な為，LS結合では固有状態を簡単に表現できない事がわかる。

Mo XXIVについては電子配置間の相互作用は計算に含んでいない。しかしながら，Schwob[28]の実験値と比較すると，0.04Å程度の相違しかない。

Mo XXV～XXIX についても計算と比較すべき実験例はない。次に挙げるMo XXX，XXXIに準じる誤差範囲にすると思われる。

Mo XXXの計算値とMansfield [22]の実験の結果との比較を表6に示す。Δは自乗平均偏差を示す。表中に見られる様に，$(3s)^2$ $(3d)$ $^2D_{5/2}$ を除いては3.6kK以内で一致している。$(3s)^2$ $(3d)$ $^2D_{5/2}$ の同定は再検討を要する。

gAでは上位のレベルのgを，gfでは下位のレベルのgを掛けている。エネルギー準位は，Jとエネルギーで表している。

4. 考　　察

Mo XVの計算結果と，Schweitzer 他[21]の実験による波長との比較を表5に示す。実験精度の範囲内で十分一致している。従って，HXR法によるΔE_{av}が4.5kK以内の誤差でab initioに計算できている事がわかる。

Mo XVI はNBSグループの計算[8]を再現したものであるので，エネルギーレベルについては言及しない。しかし，Burkhalter 他[27]に示されているgf の値と我々の計算結果を比較すると，15％程度大きくなっている。これは動径方向の波動関数の相違により，既約電気双極子モーメントが我々の方が小さくなっている事によるものである。しかしながら，彼等の計算については詳細は述べられていないので，相違の要因は明らかではない。

Mo XVII，XVIII もWyart 他[13) 14)]による計算を再現したものであるので，特に言及しない。但し，我々の計算では有効パラメーターTが含まれていない。しかしTによる効果は10^2 cm^{-1} のオーダーであり，現状の計算及び実験精度では問題とならない。又，振動子強度については，我々のMo XVII の計算結果は，Barkhalter他[27]の結果とよく合っていて，Mo XVIで見られた様な相違はない。

以上の様にMo XVI，XVII，XVIIIについては，すでに求っているエネルギーパラメーターを引用し，計算を再現した。我々は，HXR法の計算に基づいてデータをまとめておく事が，これからの研究に役立つであろうと考えている。又，Mo XVIII では相対線強度しか与えられていなかったが，今回はその絶対値を表に示した。

Mo XIX～XXIII については比較するデータはない。Mo XIX，XXについては，表2に示す様に電子配置の平均エネルギーをHXR法によって得られた値に0～30.5kK加えた値を採用した。これは，Mo XVI，XVII，XVIII ではHXR法による計算結果から実験より求めた結果を引いた値が，電離が進むにつれて5kKずつ小さくなっていく傾向を，Mo XIX，XXについて外挿したものである。各電子配置の構造を評価しても，Mo XIX，XXに対して，以上の様な傾向が急変するという理由は見当らない。従って，スケーリングの係数が3％程度として，0.5Å程度の誤差と考えられる。又，エネルギーレベルの表より，電子配置が複雑な為，LS結合では固有状態を簡単に表現できない事がわかる。

Mo XXIVについては電子配置間の相互作用は計算に含んでいない。しかしながら，Schwob[28]の実験値と比較すると，0.04Å程度の相違しかない。

Mo XXV～XXIX についても計算と比較すべき実験例はない。次に挙げるMo XXX，XXXIに準じる誤差範囲にすると思われる。

Mo XXXの計算値とMansfield [22]の実験の結果との比較を表6に示す。Δは自乗平均偏差を示す。表中に見られる様に，$(3s)^2$ $(3d)$ $^2D_{5/2}$ を除いては3.6kK以内で一致している。$(3s)^2$ $(3d)$ $^2D_{5/2}$ の同定は再検討を要する。

Mo XXXI についてHXR法のab initio の計算，我々の経験なスケーリングによる計算，実験値によるエネルギーの値[22]を表7に比較する。Δは実験値と計算値との差の大きさを示す。スケーリングによる計算結果がab initio のそれに比べ，偏差が$\frac{1}{3}$程度になっている事がわかる。

Mo XXXII は実験値[22)27)]よりスレーター・パラメーターを求めたものであるが，スピン軌道相互作用ζのスケーリングは0.95程度が適当である事がわかる。又，n＝4からn＝4への遷移によるスペクトルはまだ同定されていないが，これらのスペクトルもトカマクの分光研究において利用価値が高いと期待できる。それに対する波長精度は±1Å程度である。

Mo XXXIII の計算結果は，Kallne 他[29]の実験結果と0.004Å程度で一致している。

Mo XXXIVの$(2p)^4$（3d）の計算結果とBoiko 他[24]の測定値との比較を表8に示す。測定値の誤差は10ｋK程度と評価されている。我々の計算値は実験値と51ｋK程度というかなり大きな相違がある。$(^3P)^2$ Dについて，特に違いが大きい。計算に用いるべき，エネルギーパラメーターを更に検討する必要があるのではないかと思っている。

Mo XXXV～XXXIXについては比較すべきデータはない。Mo XXXIVと同程度の誤差と考えると，n＝3から2への遷移で0.02Å程度の誤差と推定できる。n＝2の間での遷移では，スケーリングの誤差が5％として波長にして1Å程度と推定できる。

Mo XL でパラメーターを導いたEdlénの経験式[26]で，彼自身はNi まで計算している。それをMoまで用いているので，高次項の影響を評価すると，n＝2の間の波長については3％，n＝3から2への波長については0.2％程度の誤差と考えられる。

全体的にスケーリングの係数を見ると，鉄族について行われているFawcett[17)18)19)]のスケーリングと比べても矛盾はないと思える。Mo XXXI に見られる様に，我々の計算結果はHXR法のab initio の結果よりも，スケーリングという経験的な操作を行う事により，実験値に近づける事ができた。実験値がないので電子配置の平均エネルギーについては大部分はab initio の値を用いざるを得なかった。簡単な電子配置（例えばアルカリ型，希ガス型）の場合には，それでもかなり信頼できる値となる。複雑な電子配置を取扱う場合には例外もあるかも知れないが，電子配置内のパラメーター（F，G，ζ）がある程度正しく与えられていれば，計算による波長を全体的に平行移動する事により実際の値に近づくと言える。従って，スペクトルのパターンによって同定する方法を取れば，これらの計算結果はかなり利用できるであろう。

取扱った様な高電離の重イオンにおいては，相対論の効果はかなり大きくなる。HXR法では一次のオーダーの相対論的補正しか含んでいないが，Mansfield 他[22]の論文に示されているDirac－Hartree－Fockによる計算結果（Mo XXXII）と比較しても，有意な差は見られない。

gf の値についてその誤差を評価する事は困難であるが，Aℓ型，Mg 型に関する鉄族あたりのFawcett の計算[17)18)]では，gf の小さい値（gf ＜0.05）を除いては15％の精度であると彼等が評価している。従って，我々の計算もそれに準ずると考えられる。

スペクトル全体を見渡すと，Mo XVII～XXIII の$\Delta n=0$遷移のスペクトルはすべて65Å～85Åの範囲内に全く重なっている。更に，これらは複数の3d 電子を含む電子配置間の極

めて複雑なスペクトルである。これらイオンの電離状態は電離エネルギーが類似していて，プラズマ中でも同じ温度範囲で出現する事を考えると，スペクトルの同定は実際非常に困難である。$\Delta n \neq 0$のスペクトルは，電離が進むにつれ明らかに短波長側へ移動してゆき，各電離度のスペクトルの集りとしては分離している。プラズマ中のこの様なイオンに関する情報を得るには，$\Delta n = 1$のスペクトルを各電離状態で一つの集りとして取扱う事が最っとも現実性がある。図1にBurkhalter 他[23]がレーザー生成プラズマで得たスペクトルを示す。一般的に，$\Delta n = 0$の遷移に伴うスペクトルは，1つの電離状態についてみると広範囲に拡がり，スペクトル一本一本が分離しやすい様に思える。しかし，実際には電離度の異なるイオンからのスペクトルが重なり合って同定は難しくなる。又，$\Delta n = 1$の場合は反対に，電離度の違うイオンからのスペクトルは重ならないが，各イオンのスペクトルが短波長の狭い領域に分布し，その分離には大きな分解能が必要となる。Mo XXXIV～XXXIXについても，その一般的な事が言える。

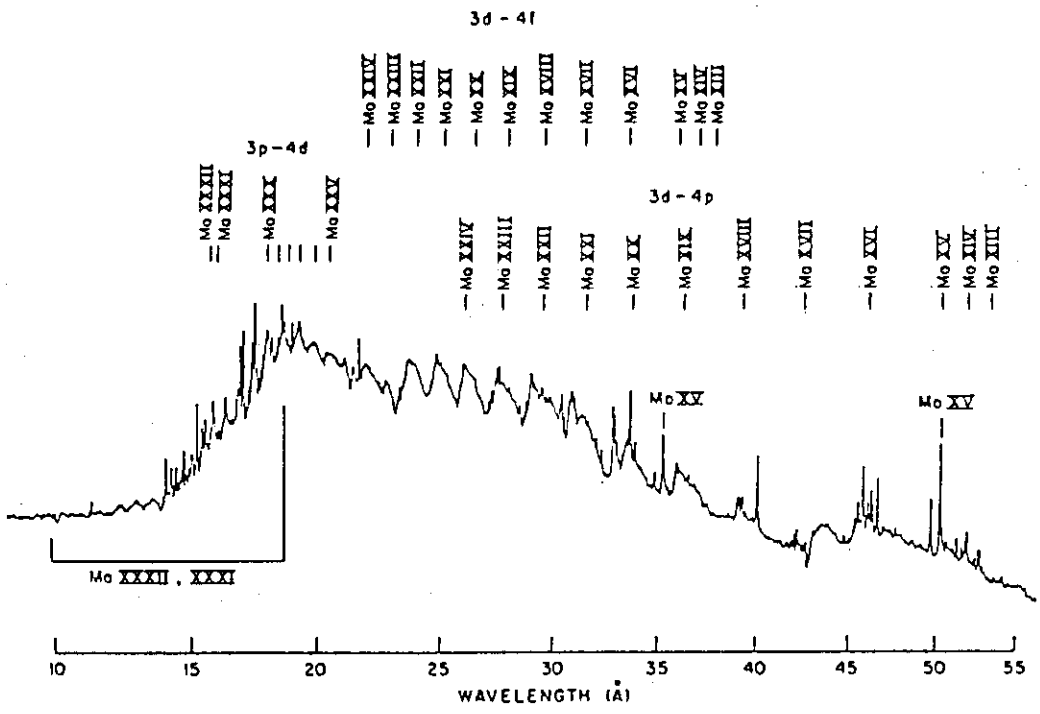


図1　レーザー生成プラズマによる10 Å～55 ÅのMoのスペクトル分布[23]

結　　言

我々はMo XV～XLのスペクトルを，HXR法によるab initioの計算でエネルギーパラメーターを求め，それを経験的にスケーリングして，計算した。これにより，単なる理論計算より測定値に近い結果が得られた。これらの計算結果は，実験によって得られたスペクトルの解析の一助として，特に新しいスペクトルの同定において有効だと考えられる。今回のスケーリングは，実験データが数少なかったが，今後の実験結果から更に詳細にスケーリングの係数を決めてゆく事が必要である。

謝　　辞

最後に本研究で用いたプログラムを開発したDr. R. D. Cowanに深く感謝します。又，竹内浩副主任研究員の御指導と普段より協力して頂いている原子分子研究室中井洋太室長，核データセンター白井稔三研究員に感謝します。

結　　言

我々はMo XV～XLのスペクトルを，HXR法によるab initioの計算でエネルギーパラメーターを求め，それを経験的にスケーリングして，計算した。これにより，単なる理論計算より測定値に近い結果が得られた。これらの計算結果は，実験によって得られたスペクトルの解析の一助として，特に新しいスペクトルの同定において有効だと考えられる。今回のスケーリングは，実験データが数少なかったが，今後の実験結果から更に詳細にスケーリングの係数を決めてゆく事が必要である。

謝　　辞

最後に本研究で用いたプログラムを開発したDr. R. D. Cowanに深く感謝します。又，竹内浩副主任研究員の御指導と普段より協力して頂いている原子分子研究室中井洋太室長，核データセンター白井稔三研究員に感謝します。

参考文献

1) P.G. Carolan and V.A. Piotrowicz, "The behaviour of impurities out of coronal equilibrium", Plasma Phys., 25 1065 ('83)
2) K. Ishii et al., "Bibliography on spectra of multiply charged molybdenum ions", 未公開資料 ('85)
3) T. Shirai et al., "Spectral data for highly ionized molybdenum, Mo VI - Mo XLII", JAERI-M 85-173 ('85)
4) R.D. Cowan, "Spectra of highly ionized atoms of tokamak interest", LA-6679-MS ('77)
5) M. Klapisch, R. Perel, and D. Weil, "Theoretical energy levels and wavelengths for some spectra of highly ionized molybdenum between Mo XL and Mo XXIV", EUR-CEA-FC-827 ('76)
6) C.F. Fisher and H.P. Saha, "Multiconfiguration Hartree-Fock results with Breit-Pauli corrections for forbidden transitions in the $2p^4$ configuration", Phys. Rev., A28 3169 ('83)
7) L.A. Armstrong, Jr. W.R. Fielder, and D.L. Lin, "Relativistic effects on transition probabilities in the Li and Be isoelectronic sequences", Phys. Rev., A14 1114 ('76)
8) A.N. Ryabtsev and J. Reader, "Spectra of the cobaltlike ions Sr XII, Y XIII, Zr XIV, Nb XV, and Mo XVI", J. Soc. Opt. Am., 72 710 ('82)
9) J.F. Wyart et al., "The $3d^9$-$3d^8 4p$ transitions in the spectra of highly-ionized elements yttrium to silver (Y XIII - Ag XXI)", Phys. Scr., 26 141 ('82)
10) K. Ando and K. Ishii, "Identification of $3d^9$-$3d^8 4f$ transition in Mo XVI", J. Phys. Soc. Japan, 54 3297 ('85)
11) J. Reader and A. Ryabtsev, "Revised $3p^6 3d^8\ {}^1S_0$ level of Sr XIII, Y XIV, Zr XV, Nb XVI and Mo XVII", J. Opt. Soc. Am., 73 1207 ('83)
12) J. Reader and A. Ryabtsev, "$3p^6 3d^8$-$3p^5 3d^9$ transitions in Sr XIII, Y XIV, Zr XV, Nb XVI, and Mo XVII", J. Opt. Am., 71 231 ('81)
13) J.F. Wyart et al., "Spectra of the ironlike ions from Y XIV to Ag XXII", Phys. Scr., 27 275 ('83)
14) J.F. Wyart et al., "Spectra of the manganese-like ions from Y XV to Ag XXIII", Phys. Scr., 28 381 ('83)
15) J. Sugar and V. Kaufman, "Predicted wavelengths and transition rates for magnetic-dipole transitions within $3s^2 3p^7$ ground configurations of ionized Cu to Mo", J. Opt. Soc. Am., B1 218 ('84)

16) R.D. Cowan, "The theory of atomic structure and spectra", (Univ. Calif. Press, Berkley, '81)
17) B.C. Fawcett, "Calculated oscillator strengths and wavelengths for allowed transitions within the third shell for ions in the Mg-like isoelectronic sequence between S V and Ni XVII", ADNDT 28 579 ('83)
18) B.C. Fawcett, Calculated oscillator strengths and wavelengths for allowed transitions within the third shell for ions in the Al-like isoelectronic sequence between Cl V and Ni XVI", ADNDT, 28 557 ('83)
19) B.C. Fawcett, "Calculated wavelengths, oscillator strengths, and energy levels for allowed n=2-3 transitions in Be-like ions O V to Ni XXV", ADNDT, 30 1 ('84)
20) K. Ishii, Bunkokenkyu, 34 3 ('85)
21) N. Schweitzer et al., "Nickel-like spectra of elements Y XII to Ag XX from a vacuum spark", J. Soc. Opt. Am., 71 219 ('71)
22) M.W.D. Mansfield et al., "The XUV spectra of highly ionized molybdenum", J. Phys., B11 1521 ('78)
23) G.A. Doscheck and U. Feldman, "Diagnostic forbidden lines of highly ionized elements for tokamak plasmas", J. Appl. Phys., 47 3083 ('76)
24) V.A. Boiko et al., "X-ray spectra of YXXXI and Mo XXXIV ions from laser-produced plasmas", J. Phys., B11 L503 ('78)
25) B. Edlén, "Comparison of theoretical and experimental level values of the n=2 configurations in the carbon isoelectronic sequence", Phys. Scr., 31 345 ('85)
26) B. Edlén, "Accurate semi-empirical formulae for the energy structure of Li-I like spectra", Phys. Scr., 19 255 ('79)
27) P.G. Burkhalter, J. Reader, and R.D. Dowan, "Spectra of Mo XIII-XVIII from a laser-produced plasma and a low-inductance vacuum spark", J. Opt. Soc. Am., 70 912 ('80)
28) J.L. Schwob et al., "Identification of Mo XV to Mo XXXIII in the soft x-ray spectrum of the TFR tokamak", EUR-CEA-FC-887, ('77)
29) E. Källne, J. Källne, and R.D. Cowan, "High-resolution x-ray spectra from molybdenum ions in the Alcator-C tokamak", Phys. Rev., A27 2682 ('83)

表1　エネルギーパラメーターのスケーリング・ファクターMoXV～XVI

本計算で用いたエネルギーパラメーターとHXR法によるパラメーターとの比を示す。但し，ΔE_{av}（励起状態の電子配置の平均エネルギーと基底状態の平均エネルギーの差）については，用いたエネルギーとHXR法の計算結果との差をkKを単位で示す。

	Mo XV $(3d)^9(4p)$ $(3d)^9(4f)$	Mo XVI [a] $(3d)^8(4p)$
Δ Eav	+4.7 [b]	+3.58
$F^2(3d,3d)$	——	0.92
$F^4(3d,3d)$	——	0.91
ζ_{3d}	0.92	0.92
$\zeta_{4\ell}$	0.92	0.92
$F^2(3d,4\ell)$	0.97	0.97
$G^1(3d,4\ell)$	0.95	0.92
$G^3(3d,4\ell)$	0.95	0.97

(kK)

表2　エネルギーパラメーターのスケーリング・ファクターMoXVI～XXIV

	Mo XVI [a]	Mo XVII [b]	Mo XVIII [c]	Mo XIX	Mo XX	Mo XXI ～XXIII
$(3d)^n$	$(3d)^9$	$(3d)^8$	$(3d)^7$	$(3d)^6$	$(3d)^5$	$(3d)^4$ ～$(3d)^2$
F (d,d)	——	0.92	0.92	0.95	0.95	0.95
F (d,d)	——	0.93	0.94			
ζ_d	0.92	0.91	0.93	0.95	0.95	0.95
$(3p)^5(3d)^{n+1}$	$(3p)^5(3d)^{10}$	$(3p)^5(3d)^9$	$(3p)^5(3d)^8$	$(3p)^5(3d)^7$	$(3p)^5(3d)^6$	$(3p)^5(3d)^5$ ～$(3p)^5(3d)^3$
ΔEav(kK)	−30.5	−25.0	−20.6	−15	−10	0
$F^2(d,d)$	——	——	0.89	0.90	0.90	0.90
$F^4(d,d)$	——	——	0.90			
ζ_p	0.97	0.97	0.96	0.95	0.95	0.95
ζ_d	——	0.98	0.93			
$F^2(p,d)$	——	0.96	0.94	0.95	0.95	0.95
$G^1(p,d)$	——	0.86	0.88	0.90	0.90	0.90
$G^3(p,d)$	——	0.94	0.90			

Mo XXIV	
ζ	0.95

表3　エネルギーパラメーターのスケーリング・ファクターMoXXV～XXXIII

	XXV	XXVI	XXVII	XXVIII	XIX	XXX
$3p^n$	$(3p)^6$	$(3p)^5$ a)	$(3p)^4$ a)	$(3p)^3$ a)	$(3p)^2$ a)	$(3p)$ a)
ζ	0.94	0.94	0.94	0.94	0.94	0.93
F	0.90	——	0.88	0.89	0.89	——
R	0.90	0.90	0.90	0.90	0.90	0.90
config. inter.	$(3p)^4(3d)^2$	$(3s)(3p)^5(3d)$, $(3p)^3(3d)^2$	$(3p)^6$, $(3s)(3p)^4(3d)$, $(3p)^2(3d)^2$	$(3p)^5$, $(3s)(3p)^3(3d)$, $(3p)(3d)^2$	$(3p)^4$, $(3s)(3p)^2(3d)$, $(3s)^2(3d)^2$	$(3p)^3$, $(3s)(3p)(3d)$ $(3p)(3d)^2$
ζ	0.94	0.94	0.94	0.94	0.94	0.94
F, G, R	0.90	0.90	0.90	0.90	0.90	0.90
$(3p)^{n-1}(3d)$, $(3s)(3p)^{nH}$ config. inter.	$(3p)^5(3d)$. $(3p)^3(3d)^3$; $(3s)(3p)^3(3d)^2$	$(3p)^4(3d)$, $(3s)(3p)^6$ $(3p)^6(3d)$, $(3s)(3p)^4(3d)^2$	$(3p)^3(3d)$, $(3s)(3p)^5$ $(3p)^5(3d)$, $(3s)(3p)^3(3d)^2$	$(3p)^2(3d)$ $(3s)(3p)^4$ $(3p)^4(3d)$, $(3s)(3p)^2(3d)^2$	$(3p)(3d)$, $(3s)(3p)^3$ $(3p)^3(3d)$, $(3s)(3p)(3d)^2$	$(3d)$ b) $(3s)(3p)^2$ b) $(3p)^2(3d)$, $(3s)(3d)^2$ $(3d)^3$
ζ	0.94	0.94	0.94	0.94	0.94	0.94
F, G, R	0.90	0.90	0.90	0.90	0.90	0.90

XXXI
$(3s)^2$
0.94
0.90
0.90
$(3s)(3d)$, $(3p)^2$, $(3d)^2$
0.94
0.90
$(3s)(3p)$
$(3p)(3d)$
0.94
0.90

XXXII c)	
ζ_{3p}	0.94
ζ_{3d}	0.86
ζ_{4p}	0.95
ζ_{4d}	0.91
ζ_{4f}	0.97

XXXIII	
F, G, R	0.90
ζ	0.95
even	$(2p)^6$ $(2s)(2p)^6(3s)$ $(2p)^5(3p)$ $(2s)(2p)^6(3d)$
odd	$(2p)^5(3s)$ $(2s)(2p)^6(3p)$ $(2p)^5(3d)$

表4　エネルギーパラメーターのスケーリング・ファクターMoXXXIV～XL

	Mo XXXIV	Mo XXXV～Mo XXXVIII	Mo XXXIX
lower level	$(2s)^2(2p)^5$ a)	$(2s)^2(2p)^n$ $(2p)^{n+2}$	$(2s)^2$ $(2p)^2$
ζ	0.943	0.95	0.95
F, G, R	——	1.00	1.00
upper level n=2	$(2s)(2p)^6$	$(2s)(2p)^{n+1}$	$(2s)(2p)$
ζ	——	0.95	0.95
F, G	——	1.00	1.00
n=3	$(2s)^2(2p)^4(3s)$ $(2s)^2(2p)^4(3d)$ $(2s)(2p)^5(3p)$ $(2p)^6(3s)$ $(2p)^6(3d)$	$(2s)^2(2p)^{n-1}(3s)$ $(2s)^2(2p)^{n-1}(3d)$ $(2s)(2p)^n(3p)$ $(2p)^{n+1}(3s)$ $(2p)^{n+1}(3d)$	$(2s)(3p)$ $(2p)(3s)$
ΔE_{av}	−85.0 kK b)	0.00	0.00
F, G, ζ, R	1.00	1.00	1.00

Mo XL	
E_{2p}	+6.4 kK
ζ_{2p}	0.94
E_{3s}	+25.8
E_{3p}	−0.6
ζ_{3p}	0.94
E_{3d}	−14.5
ζ_{3d}	0.98

表5　MoXVのスペクトルの計算結果と実験値[21]の比較

transition array	multiplet	observed	calculated
$3d^{10}$ —— $3d^9 4p$	$^1S_0$ —— $^1P_1$	50.44	50.426
	—— $^3D_1$	49.91	49.916
$3d^9 4f$	$^1S_0$ —— $^3D_1$	36.06	36.057
	—— $^1P_1$	35.368	35.212

表6　MoXXXのエネルギーの計算結果と実験値[22)]の比較

12.1 kK は自乗平均偏差を示す。

a）（2.9 kK）は，$(3s)^2(3d)\,^2D_{5/2}$ を含まない場合の自乗平均偏差を示す。

configuration	multiplet	observed	calculated	Δ
$(3s)^2(3p)$	$^2P_{1/2}$	0	0	0
	$^2P_{3/2}$	204.0	200.4	3.6
$(3s)(3p)^2$	$^2P_{1/2}$	885.35	886.0	−0.7
	$^2S_{1/2}$	1085.1	1088.7	−3.6
	$^2P_{3/2}$	1081	1078.0	3
$(3s)^2(3d)$	$^2D_{3/2}$	1151.1	1148.8	2.3
	$^2D_{5/2}$	1198.2	1169.2	29.0
			Δ 12.1 (2.9 a))	

(k K)

表7　MoXXXIのエネルギーの計算結果（スケーリングした値とHXR法ab initioの値）と実験値[22)]の比較

		observed	ab Initio	scaled
$3s^2$	$^1S_0$	0	0	0
3s3p	$^3P_1$	524.9	517.6	524.8
	$^3P_2$	698.1	700.7	697.7
	$^1P_1$	862.14	870.7	851.9
3s3d	$^1D_2$	1740.13	1758.2	1734.6
	$^3D_1$	1543	1545.0	1543.4
	$^3D_2$	1561	1566.4	1563.2
	$^3D_3$	1585.8	1595.6	1591.8
			Δ = 9.2	Δ = 3.3

(k K)

表8　MoXXXIV$(2p)^4(3d)$のエネルギーの計算結果（E_{av}を85kK小さく見積った値とHXR法 ab initioの値）と実験値[24]の比較

a）実験値[24]

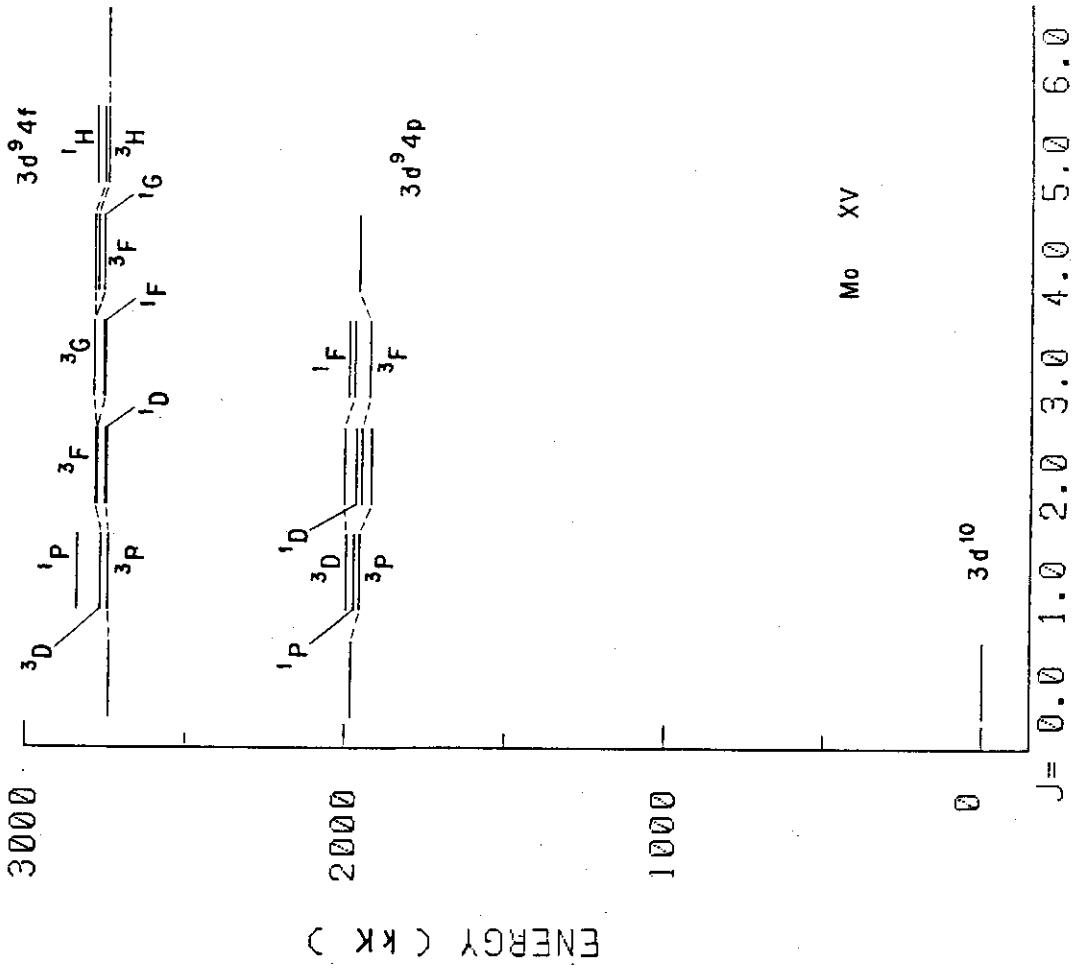
b）$\Delta E_{av} = \Delta E_{av}$（ab initio）－85kKを用いた値

Δは自乗平均偏差を示す。又（10）は実験誤差の程度を示す。

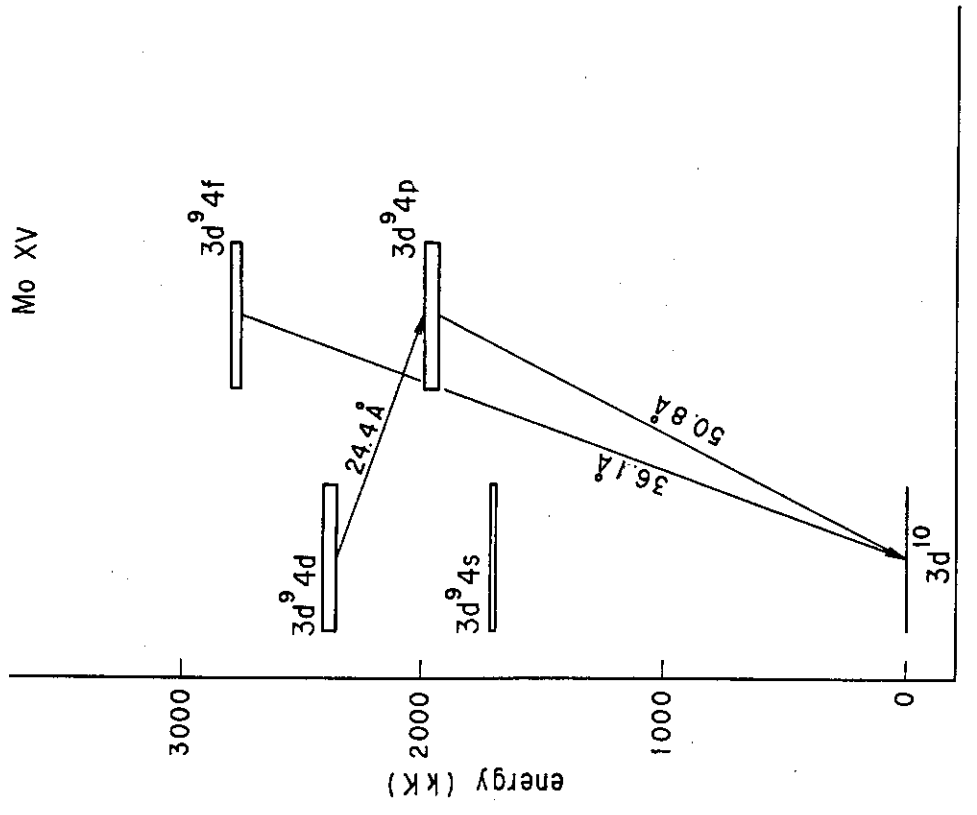
term	observed a)	ab initio	shifted b)
$(^3P)\,^2F_{5/2}$	22046	22154	22069
$(^1P)\,^2F_{5/2}$	22193	22276	22191
$(^3P)\,^2D_{3/2}$	21978	22168	22083
$_{5/2}$	22119	22110	22025
$(^1D)\,^2D_{5/2}$	22207	22260	22175
$_{3/2}$	22321	22393	22309
$(^1S)\,^2D_{3/2}$	23100	23247	23165
$(^1D)\,^2S_{1/2}$	22163	22232	22147
$(^1D)\,^2P_{3/2}$	22193	22267	22182
$_{1/2}$	22361	22423	22338
Δ	(10)	99	51

(kK)

Mo XV～XLの原子構造及びスペクトル



Mo XV エネルギーレベル
$(3d)^{10}$, $(3d)^9(4p)$, $(3d)^9(4f)$



Mo XV グロトリアン・ダイアグラム

Mo XV エネルギーレベル

EVEN 1 $(3d)^{10}$

ODD 1 $(3d)^{9}(4p)$

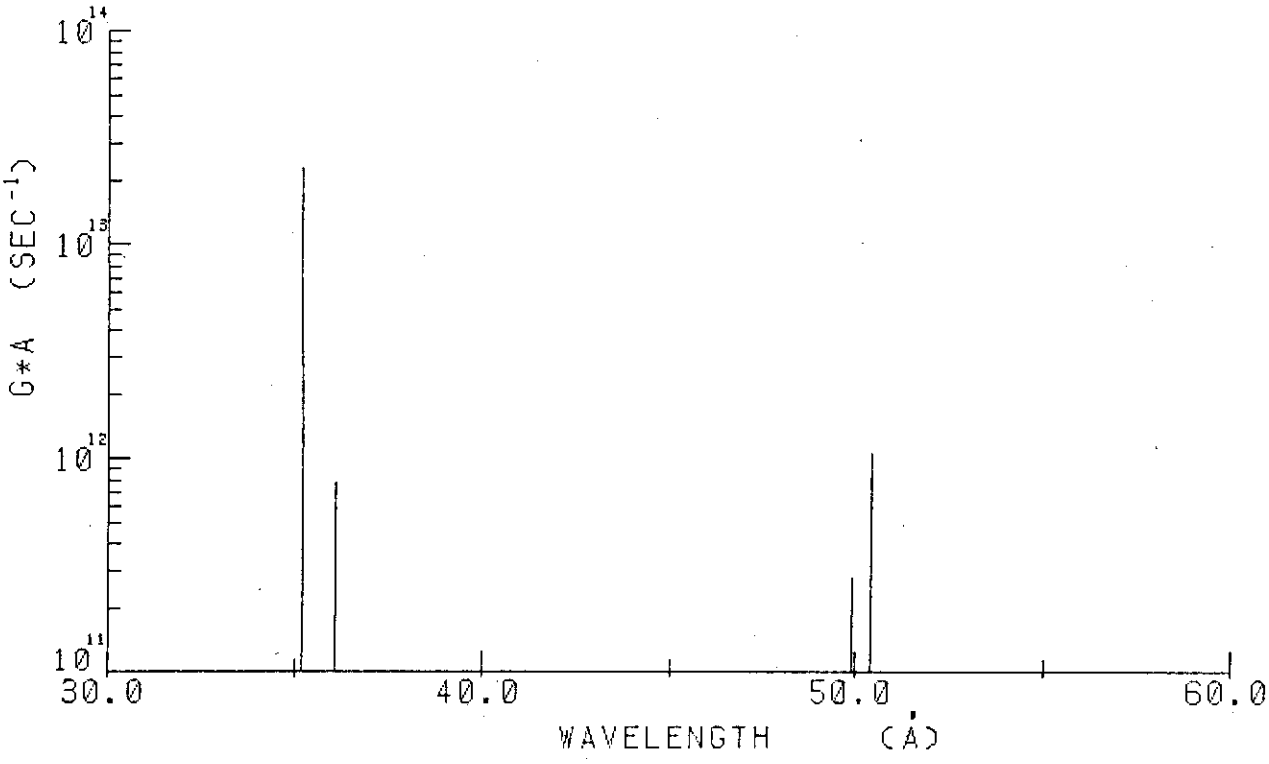
2 $(3d)^{9}(4f)$

EVEN PARITY

J	NO	ENERGY(KK)		LEADING PERCENTAGES				
0.0	1	0.0	---	1	1S100.0%			

ODD PARITY

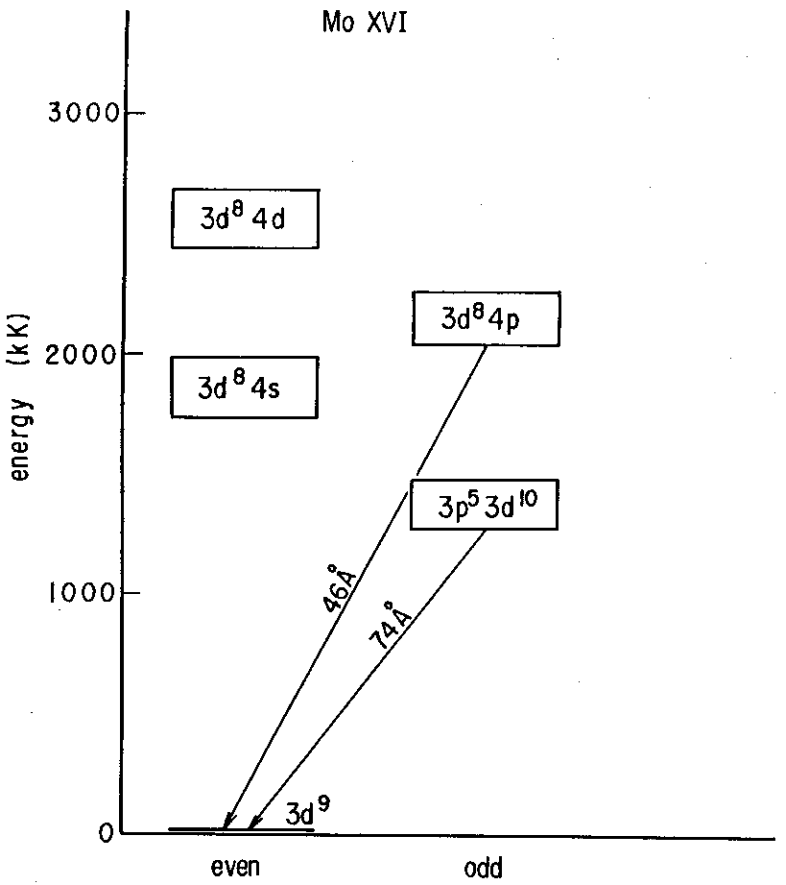
J	NO	ENERGY(KK)		LEADING PERCENTAGES				
0.0	1	1984.456	---	1	3P100.0%			
0.0	2	2746.278	---	2	3P100.0%			
1.0	1	1963.237	---	1	3P 79.0%	1	3D 21.0%	
1.0	2	1983.084	---	1	1P 79.8%	1	3D 15.3%	
1.0	3	2003.351	---	1	3D 63.7%	1	1P 20.1%	
1.0	4	2749.185	---	2	3P 91.3%	2	3D 8.5%	
1.0	5	2773.385	---	2	3D 88.8%	2	3P 7.7%	
1.0	6	2839.937	---	2	1P 96.3%	2	3D 2.8%	
2.0	1	1932.624	---	1	3P 77.3%	1	3D 16.8%	
2.0	2	1961.399	---	1	3F 87.7%	1	3D 5.9%	
2.0	3	1977.694	---	1	1D 65.2%	1	3D 19.3%	
2.0	4	2007.860	---	1	3D 58.1%	1	1D 28.7%	
2.0	5	2754.115	---	2	3P 68.4%	2	3D 20.4%	
2.0	6	2763.500	---	2	1D 40.0%	2	3F 35.2%	
2.0	7	2782.733	---	2	3D 39.6%	2	3P 31.5%	
2.0	8	2791.094	---	2	3F 64.7%	2	1D 20.0%	
3.0	1	1938.666	---	1	3F 54.3%	1	1F 32.7%	
3.0	2	1982.260	---	1	3D 72.9%	1	1F 27.0%	
3.0	3	1999.195	---	1	3F 45.7%	1	1F 40.2%	
3.0	4	2764.161	---	2	3D 56.9%	2	3F 39.9%	
3.0	5	2770.897	---	2	1F 44.0%	2	3G 21.3%	
3.0	6	2794.011	---	2	3F 40.2%	2	3D 24.5%	
3.0	7	2798.299	---	2	3G 58.4%	2	1F 37.6%	
4.0	1	1967.274	---	1	3F100.0%			
4.0	2	2766.820	---	2	3F 75.0%	2	3G 21.4%	
4.0	3	2767.716	---	2	1G 43.9%	2	3H 30.9%	
4.0	4	2786.215	---	2	3H 66.5%	2	1G 19.4%	
4.0	5	2797.095	---	2	3G 45.8%	2	1G 35.6%	
5.0	1	2758.368	---	2	3H 57.2%	2	1H 42.2%	
5.0	2	2769.076	---	2	3G 71.2%	2	1H 19.9%	
5.0	3	2788.447	---	2	1H 37.8%	2	3H 33.9%	
6.0	1	2756.945	---	2	3H100.0%			



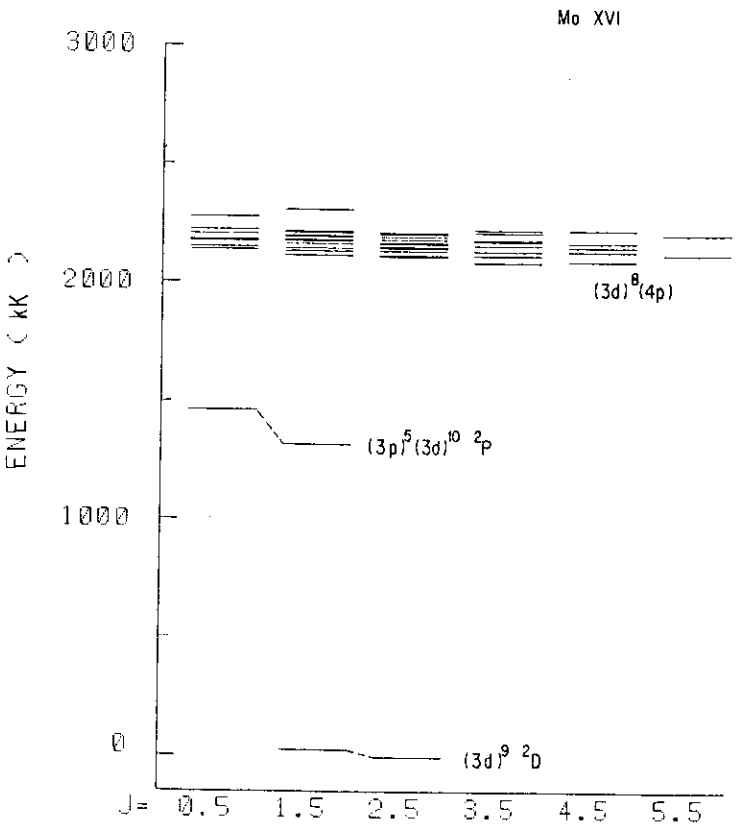
Mo XV スペクトルパターン
$(3d)^{10} - (3d)^9(4p)$
$- (3d)^9(4f)$

Mo XV 波長，振動子強度
$(3d)^{10} - (3d)^9(4p)$
$- (3d)^9(4f)$

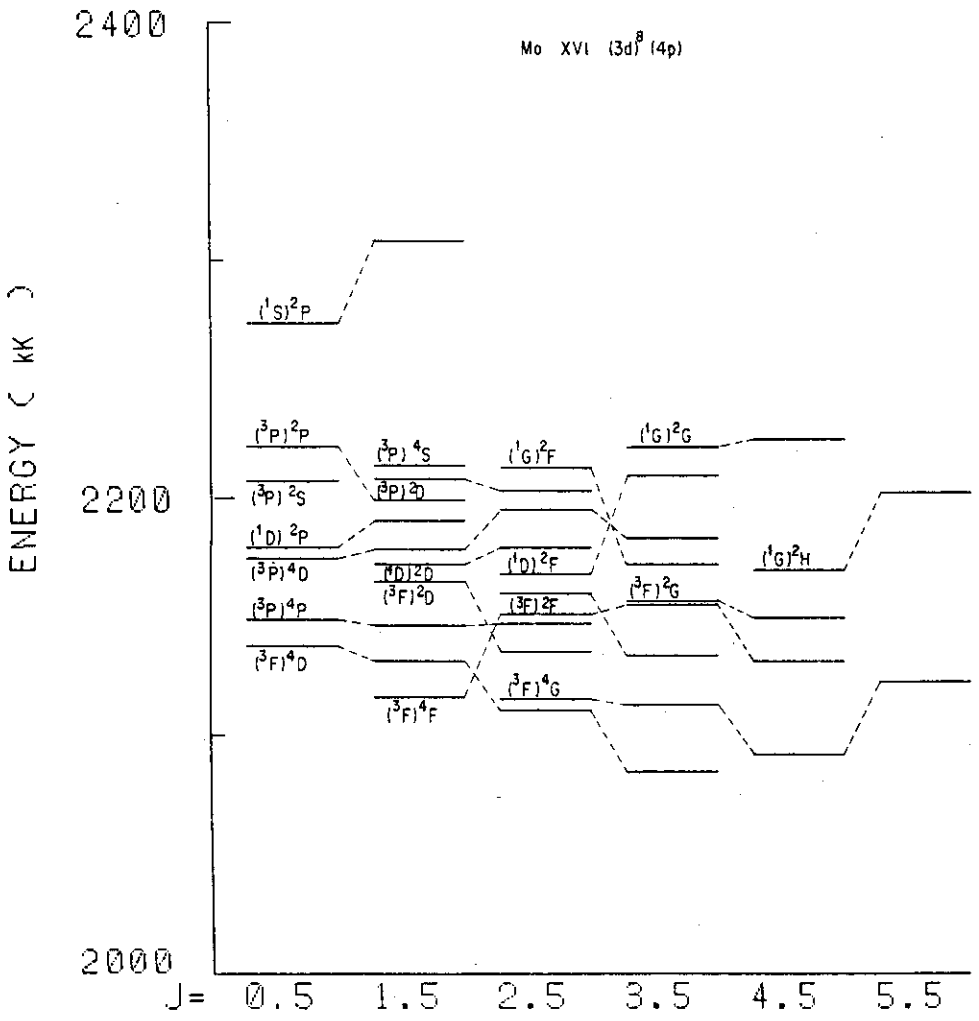
NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
1	0.0	0.0	1983.084	1.0	50.426	0.4041	0.1060E+13
2	0.0	0.0	2003.350	1.0	49.916	0.1033	0.2764E+12
3	0.0	0.0	2773.384	1.0	36.057	0.1533	0.7863E+12
4	0.0	0.0	2839.937	1.0	35.212	4.2971	0.2312E+14



Mo XVI　グロトリアン・ダイアグラム



Mo XVI　エネルギーレベル
$(3d)^9$, $(3p)^5(3d)^{10}$, $(3d)^8(4p)$



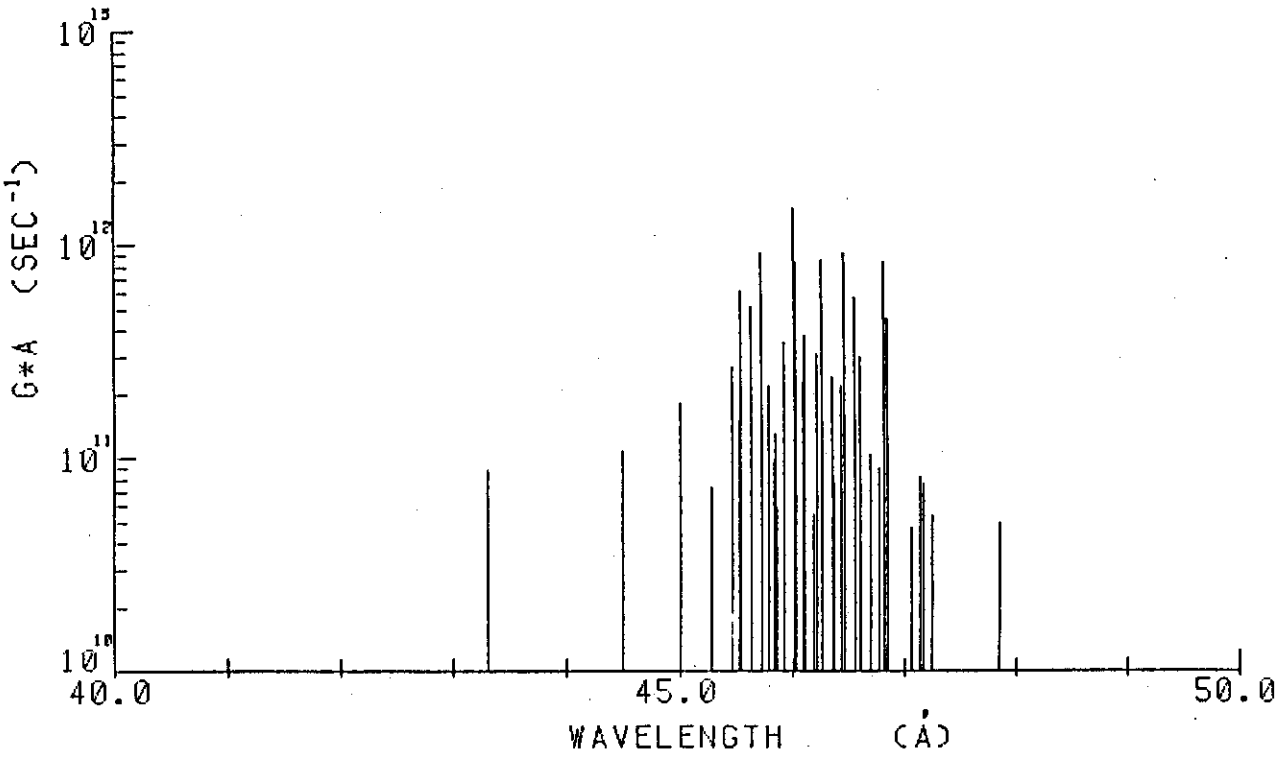
Mo XVI エネルギーレベル
$(3d)^8$ $(4p)$

Mo XVI エネルギーレベル
EVEN $(3d)^9$
ODD 1 $(3p)^5$ $(3d)^{10}$
2 $(3d)^8$ $(4p)$

EVEN PARITY

J	NO	ENERGY(KK)		LEADING PERCENTAGES	
1.5	1	26.725	---	1	2D100.0%
2.5	1	-0.300	---	1	2D100.0%

ODD J	PARITY NO	ENERGY(KK)		LEADING PERCENTAGES	
0.5	1	1463.880	---	1 2P100.0%	
0.5	2	2137.962	---	2 (3F) 4D 48.5%	2 (3P) 4D 30.1%
0.5	3	2149.298	---	2 (3P) 4P 83.5%	2 (3P) 4D 4.6%
0.5	4	2174.446	---	2 (3P) 4D 50.2%	2 (3F) 4D 26.6%
0.5	5	2179.929	---	2 (1D) 2P 32.6%	2 (3P) 2P 31.2%
0.5	6	2207.747	---	2 (3P) 2S 60.4%	2 (3P) 2P 18.9%
0.5	7	2222.385	---	2 (1D) 2P 37.5%	2 (3P) 2P 33.8%
0.5	8	2274.254	---	2 (1S) 2P 87.6%	2 (1D) 2P 4.2%
1.5	1	1318.065	---	1 2P100.0%	
1.5	2	2116.624	---	2 (1D) 2D 26.4%	2 (3F) 4F 20.2%
1.5	3	2131.828	---	2 (3F) 4D 50.1%	2 (3P) 4D 23.6%
1.5	4	2146.450	---	2 (3P) 4P 33.3%	2 (3F) 4F 19.2%
1.5	5	2164.818	---	2 (3F) 4F 40.1%	2 (3F) 2D 16.5%
1.5	6	2172.056	---	2 (3P) 2P 27.3%	2 (3P) 4D 23.3%
1.5	7	2179.032	---	2 (3F) 2D 35.3%	2 (1D) 2D 21.0%
1.5	8	2190.496	---	2 (1D) 2P 38.5%	2 (3P) 2P 17.2%
1.5	9	2199.210	---	2 (3P) 2P 37.4%	2 (1D) 2D 16.6%
1.5	10	2208.329	---	2 (3P) 2D 68.9%	2 (3P) 4D 9.4%
1.5	11	2214.211	---	2 (3P) 4S 74.8%	2 (3P) 2P 7.5%
1.5	12	2308.645	---	2 (1S) 2P 91.3%	2 (3P) 2D 2.3%
2.5	1	2110.593	---	2 (3F) 4D 59.7%	2 (3F) 4F 18.4%
2.5	2	2115.667	---	2 (3F) 4G 47.2%	2 (1D) 2F 18.4%
2.5	3	2135.241	---	2 (3F) 2D 40.7%	2 (3F) 4G 25.7%
2.5	4	2147.739	---	2 (3F) 2D 31.9%	2 (3P) 4P 19.3%
2.5	5	2151.382	---	2 (3F) 4F 32.7%	2 (3F) 4D 18.9%
2.5	6	2160.787	---	2 (3F) 2F 35.9%	2 (1D) 2D 18.4%
2.5	7	2168.206	---	2 (3P) 4P 28.3%	2 (1D) 2F 22.1%
2.5	8	2179.759	---	2 (3F) 2F 25.4%	2 (3P) 2D 24.1%
2.5	9	2195.916	---	2 (1G) 2F 30.2%	2 (1D) 2D 23.7%
2.5	10	2203.945	---	2 (3P) 4D 40.1%	2 (3P) 2D 35.5%
2.5	11	2213.294	---	2 (1G) 2F 42.1%	2 (1D) 2D 16.4%
3.5	1	2085.412	---	2 (3F) 4D 69.1%	2 (3F) 4F 16.4%
3.5	2	2113.568	---	2 (3F) 4G 64.9%	2 (3F) 2G 15.2%
3.5	3	2134.159	---	2 (3F) 2F 58.7%	2 (3F) 4D 18.4%
3.5	4	2155.897	---	2 (3F) 4F 52.2%	2 (3F) 2F 21.0%
3.5	5	2157.018	---	2 (1D) 2F 36.5%	2 (3F) 2G 34.2%
3.5	6	2172.562	---	2 (1G) 2F 64.0%	2 (3F) 2G 13.8%
3.5	7	2183.269	---	2 (3P) 4D 55.6%	2 (3F) 2G 13.8%
3.5	8	2210.324	---	2 (1D) 2F 47.2%	2 (3P) 4D 30.8%
3.5	9	2221.837	---	2 (1G) 2G 76.2%	2 (1G) 2F 17.4%
4.5	1	2092.420	---	2 (3F) 2G 37.6%	2 (3F) 4G 37.5%
4.5	2	2131.446	---	2 (3F) 4F 69.9%	2 (3F) 2G 26.3%
4.5	3	2150.385	---	2 (3F) 4G 60.3%	2 (3F) 2G 33.8%
4.5	4	2169.811	---	2 (1G) 2H 87.6%	2 (1G) 2G 10.3%
4.5	5	2224.964	---	2 (1G) 2G 88.3%	2 (1G) 2H 9.9%
5.5	1	2122.777	---	2 (3F) 4G 98.0%	2 (1G) 2H 2.0%
5.5	2	2202.460	---	2 (1G) 2H 98.0%	2 (3F) 4G 2.0%



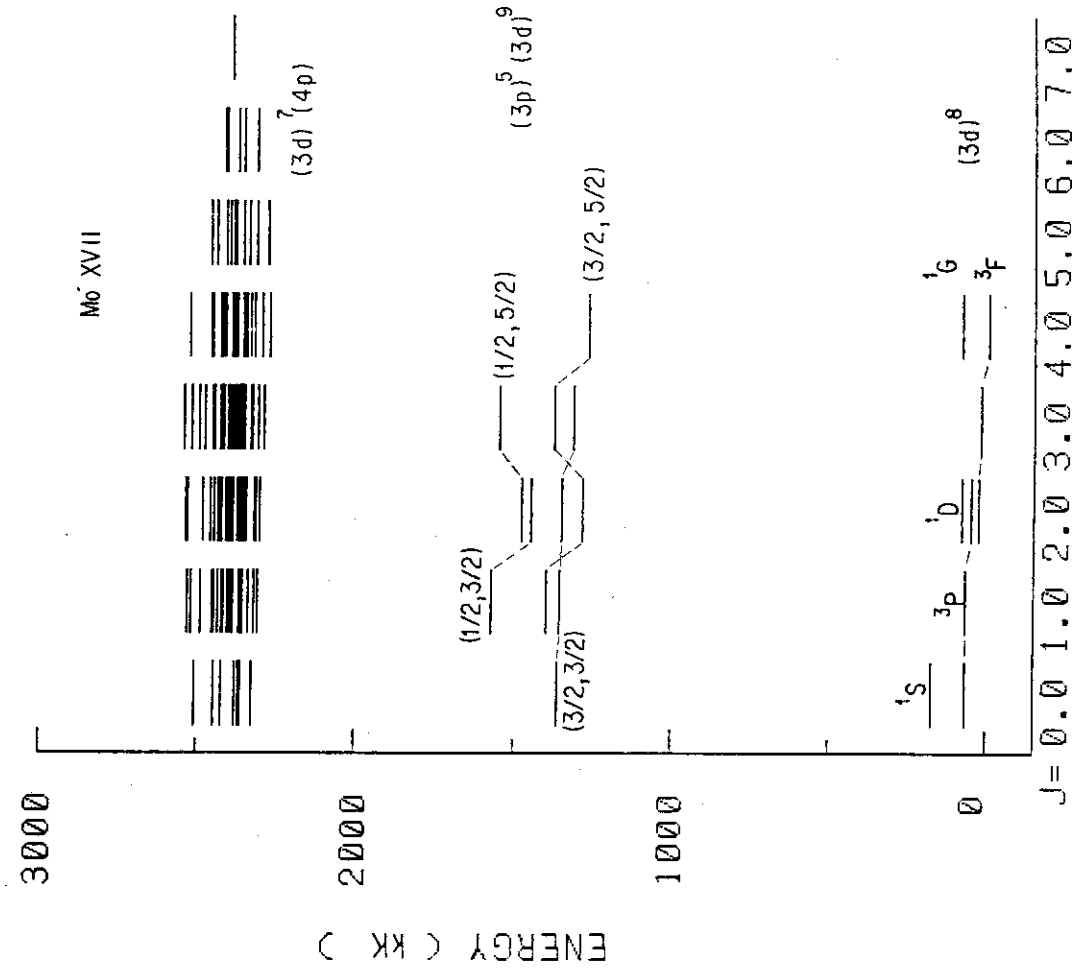
Mo XVI　スペクトル・パターン
$(3d)^9 - (3d)^8 (4p)$

Mo XVI　波長，振動子強度

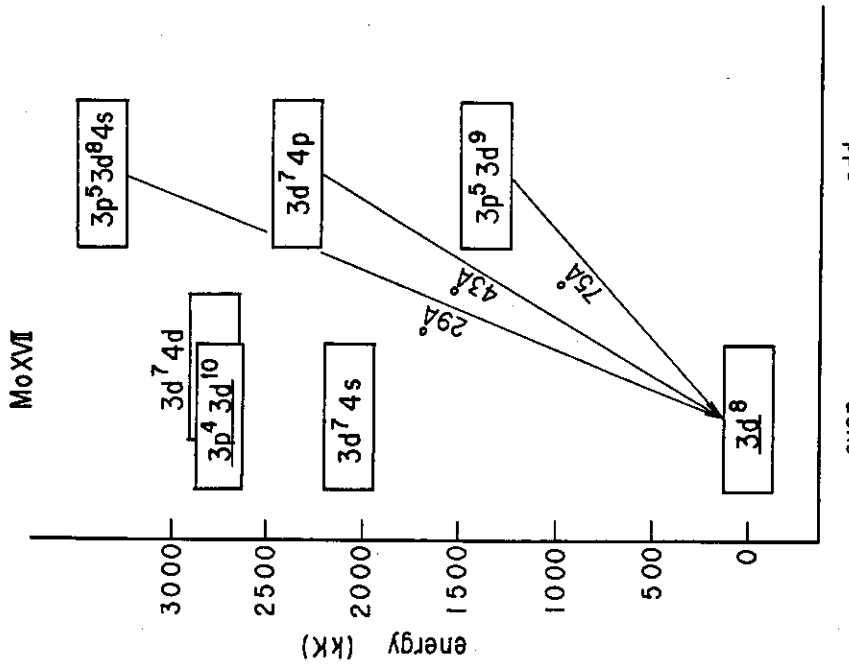
$(3d)^9 - (3p)^5\ (3d)^{10}$

$- (3d)^8\ (4p)$

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
1	26.725	1.5	1318.064	1.5	77.439	0.1602	0.1781E+12
2	-0.300	2.5	1318.064	1.5	75.852	1.4712	0.1705E+13
3	26.725	1.5	1463.879	0.5	69.582	0.8910	0.1227E+13
4	26.725	1.5	2116.624	1.5	47.849	0.0172	0.5034E+11
5	-0.300	2.5	2115.666	2.5	47.260	0.0180	0.5362E+11
6	26.725	1.5	2146.450	1.5	47.176	0.0254	0.7610E+11
7	26.725	1.5	2147.738	2.5	47.147	0.0274	0.8236E+11
8	26.725	1.5	2151.382	2.5	47.066	0.0156	0.4708E+11
9	26.725	1.5	2160.786	2.5	46.859	0.0444	0.1346E+12
10	-0.300	2.5	2134.159	3.5	46.850	0.1502	0.4564E+12
11	-0.300	2.5	2135.240	2.5	46.827	0.2734	0.8318E+12
12	26.725	1.5	2164.817	1.5	46.771	0.0298	0.9062E+11
13	26.725	1.5	2168.205	2.5	46.697	0.0342	0.1046E+12
14	26.725	1.5	2172.056	1.5	46.613	0.0982	0.3012E+12
15	26.725	1.5	2174.445	0.5	46.561	0.0198	0.6096E+11
16	-0.300	2.5	2147.738	2.5	46.554	0.1856	0.5710E+12
17	-0.300	2.5	2151.382	2.5	46.475	0.0676	0.2086E+12
18	26.725	1.5	2179.031	1.5	46.462	0.3000	0.9266E+12
19	26.725	1.5	2179.759	2.5	46.446	0.0714	0.2208E+12
20	-0.300	2.5	2155.896	3.5	46.378	0.0248	0.7686E+11
21	-0.300	2.5	2157.017	3.5	46.354	0.0774	0.2400E+12
22	-0.300	2.5	2160.786	2.5	46.273	0.2734	0.8516E+12
23	26.725	1.5	2190.495	1.5	46.216	0.1002	0.3130E+12
24	-0.300	2.5	2164.817	1.5	46.187	0.0174	0.5462E+11
25	-0.300	2.5	2168.205	2.5	46.115	0.1222	0.3832E+12
26	26.725	1.5	2195.916	2.5	46.100	0.0726	0.2276E+12
27	-0.300	2.5	2172.056	1.5	46.033	0.2650	0.8342E+12
28	26.725	1.5	2199.209	1.5	46.030	0.0734	0.2310E+12
29	-0.300	2.5	2172.562	3.5	46.022	0.4680	0.1473E+13
30	26.725	1.5	2203.945	2.5	45.930	0.1110	0.3506E+12
31	-0.300	2.5	2179.759	2.5	45.870	0.0186	0.5928E+11
32	26.725	1.5	2207.747	0.5	45.850	0.0408	0.1297E+12
33	26.725	1.5	2208.328	1.5	45.838	0.0304	0.9640E+11
34	-0.300	2.5	2183.269	3.5	45.797	0.0686	0.2180E+12
35	26.725	1.5	2213.294	2.5	45.734	0.2898	0.9242E+12
36	-0.300	2.5	2190.495	1.5	45.646	0.1622	0.5194E+12
37	26.725	1.5	2222.385	0.5	45.544	0.1900	0.6106E+12
38	-0.300	2.5	2195.916	2.5	45.533	0.0474	0.1523E+12
39	-0.300	2.5	2199.209	1.5	45.465	0.0830	0.2676E+12
40	-0.300	2.5	2208.328	1.5	45.277	0.0226	0.7326E+11
41	-0.300	2.5	2221.836	3.5	45.002	0.0556	0.1829E+12
42	26.725	1.5	2274.253	0.5	44.493	0.0324	0.1091E+12
43	-0.300	2.5	2308.644	1.5	43.310	0.0248	0.8852E+11



Mo XVII　エネルギーレベル
$(3d)^8$, $(3p)^5(3d)^9$, $(3d)^7(4p)$



Mo XVII　グロトリアン・ダイアグラム

Mo XVII　エネルギーレベル

EVEN　$(3d)^8$

ODD 1　$(3p)^5\ (3d)^9$

2　$(3d)^7\ (4p)$

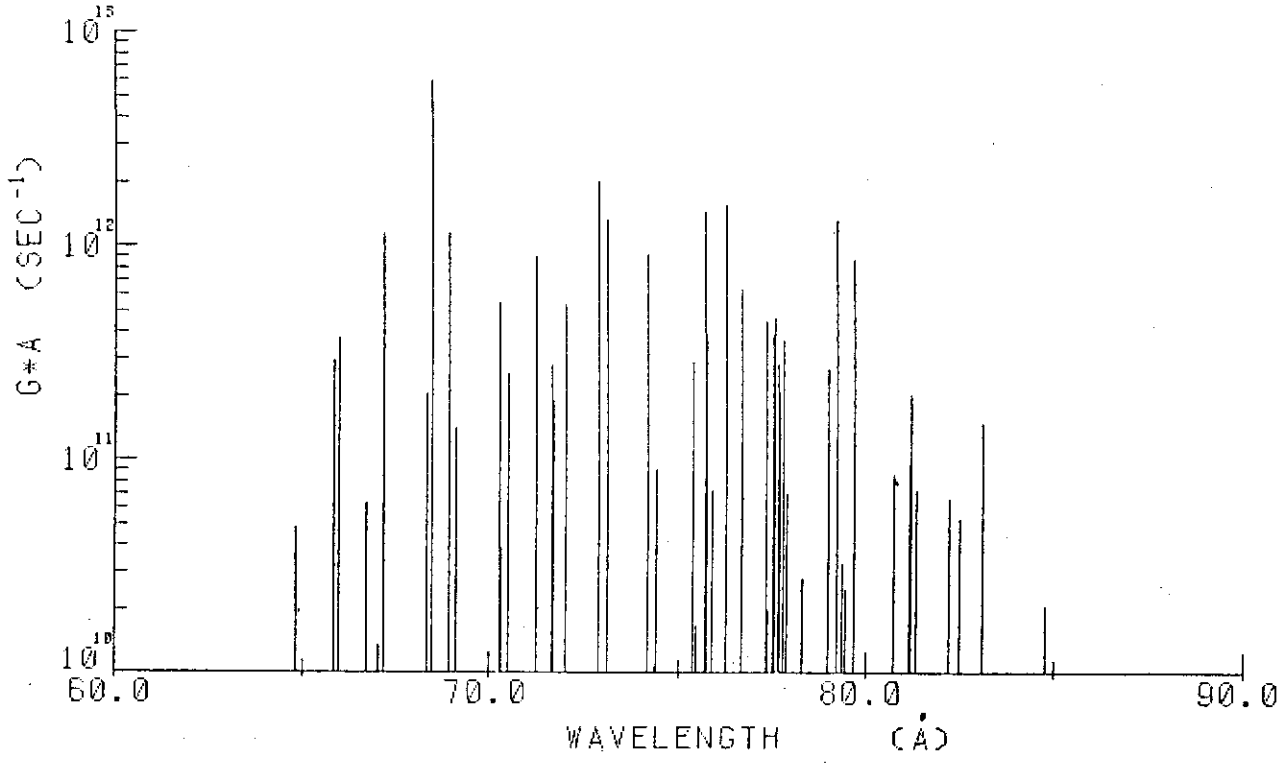
EVEN PARITY

J	NO	ENERGY(KK)		LEADING PERCENTAGES			
0.0	1	67.675	---	1	3P 93.5%	1	1S 6.5%
0.0	2	178.173	---	1	1S 93.5%	1	3P 6.5%
1.0	1	69.331	---	1	3P100.0%		
2.0	1	26.595	---	1	3F 57.1%	1	1D 34.0%
2.0	2	50.622	---	1	3P 55.9%	1	3F 31.9%
2.0	3	78.168	---	1	1D 53.8%	1	3P 35.2%
3.0	1	23.205	---	1	3F100.0%		
4.0	1	-0.661	---	1	3F 98.1%	1	1G 1.9%
4.0	2	81.460	---	1	1G 98.1%	1	3F 1.9%

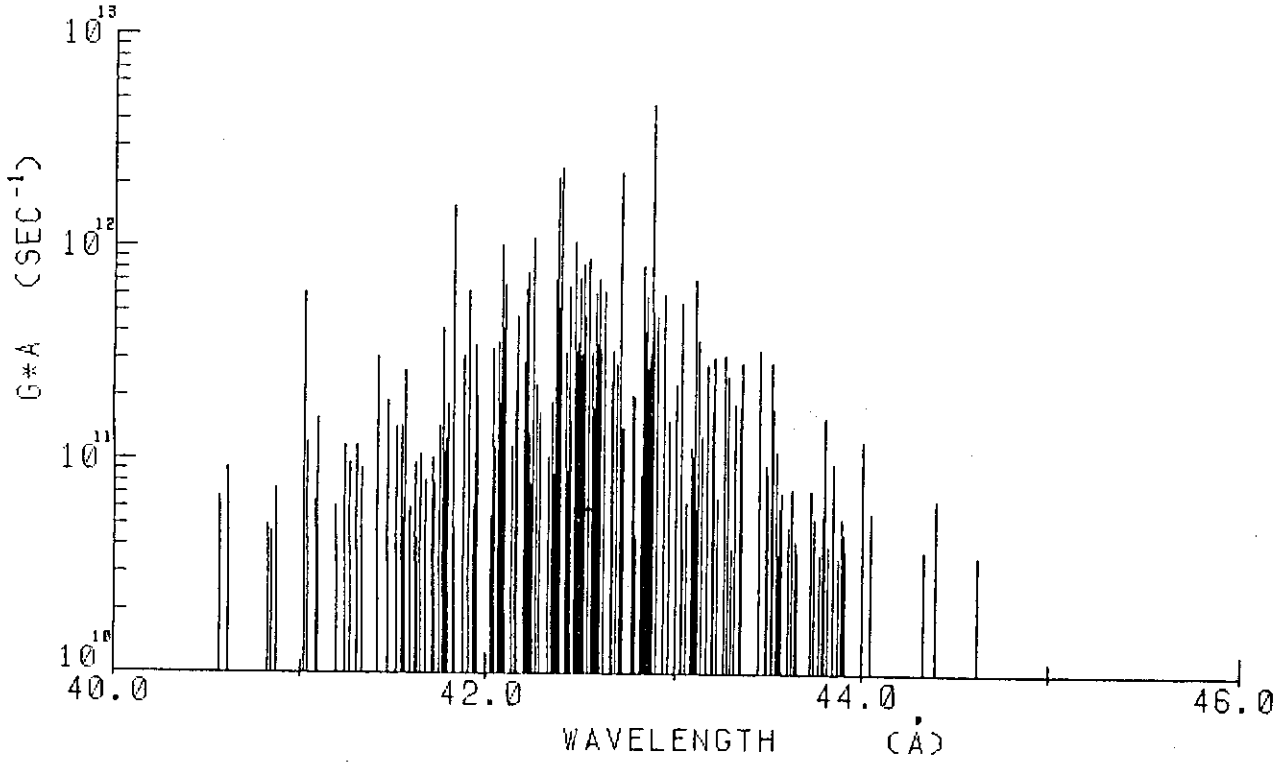
ODD J	PARITY NO	ENERGY(KK)		LEADING PERENTAGES							
0.0	1	1359.290	---	1		3P	100.0%				
0.0	2	2326.518	---	2	(4P)	5D	49.2%	2	(4F)	5D	30.5%
0.0	3	2360.044	---	2	(4F)	5D	31.2%	2	(2P)	1S	25.2%
0.0	4	2366.748	---	2	(2P)	3P	68.9%	2	(4F)	5D	10.0%
0.0	5	2380.217	---	2	(2P)	1S	42.8%	2	(4P)	5D	24.4%
0.0	6	2419.141	---	2	(4P)	3P	68.1%	2	(2P)	1S	16.7%
0.0	7	2447.557	---	2	(2D)	3P	68.7%	2	(2P)	1S	14.3%
0.0	8	2506.195	---	2	(2D)	3P	89.8%	2	(2D)	3P	3.3%
1.0	1	1354.926	---	1		3P	85.9%	1		3D	12.5%
1.0	2	1394.252	---	1		3D	63.2%	1		1P	31.6%
1.0	3	1566.633	---	1		1P	66.8%	1		3D	24.3%
1.0	4	2305.799	---	2	(4F)	5F	46.9%	2	(4F)	3D	12.4%
1.0	5	2321.496	---	2	(4P)	5D	31.1%	2	(4F)	5F	17.2%
1.0	6	2337.761	---	2	(4F)	5D	21.4%	2	(4P)	5D	14.5%
1.0	7	2353.774	---	2	(4F)	5D	28.4%	2	(2P)	3D	22.3%
1.0	8	2360.015	---	2	(4P)	5P	19.3%	2	(4F)	3D	14.8%
1.0	9	2367.406	---	2	(4P)	5D	24.8%	2	(4F)	3D	24.6%
1.0	10	2382.602	---	2	(2P)	1P	33.9%	2	(4P)	5P	17.1%
1.0	11	2384.299	---	2	(2P)	3D	32.4%	2	(2P)	3P	13.0%
1.0	12	2388.156	---	2	(4P)	3P	34.8%	2	(4P)	3S	31.5%
1.0	13	2399.112	---	2	(4P)	3P	32.7%	2	(2P)	3S	21.1%
1.0	14	2400.398	---	2	(2D)	3D	34.2%	2	(4P)	3D	21.7%
1.0	15	2415.315	---	2	(2D)	3P	36.5%	2	(2P)	1P	14.6%
1.0	16	2419.115	---	2	(2D)	1P	34.9%	2	(4P)	3D	16.7%
1.0	17	2430.298	---	2	(2D)	1P	32.2%	2	(2P)	3S	25.4%
1.0	18	2445.306	---	2	(2F)	3D	34.2%	2	(2D)	3P	26.3%
1.0	19	2451.609	---	2	(2F)	3D	43.5%	2	(2D)	3D	11.6%
1.0	20	2486.915	---	2	(2D)	3P	45.0%	2	(2D)	1P	19.4%
1.0	21	2515.835	---	2	(2D)	3P	39.3%	2	(2D)	3D	27.2%
1.0	22	2531.420	---	2	(2D)	1P	49.1%	2	(2D)	3D	32.1%
2.0	1	1281.704	---	1		1D	73.5%	1		3F	14.9%
2.0	2	1344.124	---	1		3D	50.7%	1		3P	31.2%
2.0	3	1445.186	---	1		3F	65.3%	1		1D	20.3%
2.0	4	1473.466	---	1		3P	51.2%	1		3D	41.0%
2.0	5	2300.521	---	2	(4F)	5F	50.7%	2	(4F)	5D	13.8%
2.0	6	2310.344	---	2	(4F)	5G	50.6%	2	(4F)	3F	14.4%
2.0	7	2317.481	---	2	(4P)	5D	31.3%	2	(4F)	5D	15.8%
2.0	8	2319.311	---	2	(4P)	5S	62.1%	2	(4P)	5P	13.0%
2.0	9	2345.754	---	2	(4F)	5F	27.2%	2	(4F)	5D	26.4%
2.0	10	2347.032	---	2	(4F)	3D	17.3%	2	(4F)	3F	15.6%
2.0	11	2357.342	---	2	(4F)	3F	39.8%	2	(4F)	3D	12.1%
2.0	12	2362.807	---	2	(4P)	5D	23.3%	2	(4F)	5D	13.4%
2.0	13	2366.801	---	2	(4F)	3D	28.5%	2	(2P)	3P	18.1%
2.0	14	2375.996	---	2	(4P)	3P	17.3%	2	(4P)	5P	17.0%
2.0	15	2382.430	---	2	(4P)	3D	39.8%	2	(2D)	3P	19.8%
2.0	16	2393.469	---	2	(2G)	3F	43.3%	2	(4P)	5P	10.1%
2.0	17	2394.139	---	2	(2D)	3F	40.3%	2	(2P)	3P	10.9%
2.0	18	2394.656	---	2	(4P)	3P	26.8%	2	(2G)	3F	17.1%
2.0	19	2404.452	---	2	(2F)	3D	17.1%	2	(2F)	3F	14.3%
2.0	20	2411.139	---	2	(2P)	3D	25.7%	2	(2D)	1D	16.2%

J	NO	ENERGY(KK)		LEADING PERCENTAGES	
2.0	21	2418.559	---	2 (4P) 3D 13.4%	2 (2F) 3F 12.2%
2.0	22	2425.943	---	2 (2P) 1D 25.7%	2 (4P) 3P 14.1%
2.0	23	2435.218	---	2 (2D) 3D 20.6%	2 (2P) 3P 14.0%
2.0	24	2446.071	---	2 (2F) 3F 28.5%	2 (2F) 3D 27.2%
2.0	25	2457.294	---	2 (2F) 3D 36.0%	2 (2F) 1D 32.6%
2.0	26	2480.572	---	2 (2D) 3F 65.1%	2 (2F) 3F 9.9%
2.0	27	2483.943	---	2 (2D) 3P 58.9%	2 (2D) 3P 17.0%
2.0	28	2527.828	---	2 (2D) 3D 59.0%	2 (2D) 3D 12.6%
2.0	29	2537.785	---	2 (2D) 1D 47.0%	2 (2D) 1D 19.1%
3.0	1	1310.612	---	1 3F 67.7%	1 3D 32.0%
3.0	2	1370.750	---	1 3D 59.0%	1 3F 25.1%
3.0	3	1542.078	---	1 1F 83.9%	1 3D 9.0%
3.0	4	2290.677	---	2 (4F) 5F 46.8%	2 (4F) 5D 32.8%
3.0	5	2304.200	---	2 (4F) 5G 47.5%	2 (4F) 3F 12.9%
3.0	6	2323.386	---	2 (4F) 3D 26.6%	2 (4P) 5D 16.9%
3.0	7	2333.791	---	2 (4F) 3D 37.8%	2 (4F) 3F 16.6%
3.0	8	2346.310	---	2 (4P) 3D 18.9%	2 (4F) 5F 18.7%
3.0	9	2348.658	---	2 (4F) 3F 26.2%	2 (4F) 3D 16.6%
3.0	10	2356.333	---	2 (4F) 3G 51.7%	2 (4F) 5G 11.6%
3.0	11	2360.594	---	2 (2G) 3G 29.6%	2 (2G) 3F 18.8%
3.0	12	2368.968	---	2 (2P) 3D 16.9%	2 (2D) 3F 16.6%
3.0	13	2374.716	---	2 (2P) 3D 22.4%	2 (4P) 5P 17.7%
3.0	14	2377.357	---	2 (2H) 3G 22.8%	2 (2G) 1F 21.8%
3.0	15	2385.508	---	2 (4P) 3D 40.2%	2 (4P) 5P 37.3%
3.0	16	2391.506	---	2 (2G) 3F 40.2%	2 (2G) 3G 19.6%
3.0	17	2398.744	---	2 (2D) 3D 18.6%	2 (2D) 3F 15.9%
3.0	18	2403.768	---	2 (4P) 5P 16.6%	2 (2P) 3D 12.5%
3.0	19	2413.221	---	2 (2G) 1F 27.9%	2 (2F) 3G 21.4%
3.0	20	2420.424	---	2 (2F) 3F 22.8%	2 (2F) 3D 22.4%
3.0	21	2427.054	---	2 (2H) 3G 30.1%	2 (2F) 3D 13.8%
3.0	22	2447.513	---	2 (2F) 3F 48.4%	2 (2F) 3G 17.6%
3.0	23	2450.320	---	2 (2P) 3D 22.1%	2 (2D) 1F 21.8%
3.0	24	2472.544	---	2 (2F) 1F 71.6%	2 (2F) 3D 13.3%
3.0	25	2492.782	---	2 (2D) 3F 43.0%	2 (2D) 1F 15.1%
3.0	26	2519.451	---	2 (2D) 1F 49.9%	2 (2D) 3F 29.4%
3.0	27	2543.913	---	2 (2D) 3D 54.4%	2 (2D) 3D 21.7%
4.0	1	1261.419	---	1 3F100.0%	
4.0	2	2269.608	---	2 (4F) 5D 47.2%	2 (4F) 5F 26.8%
4.0	3	2296.062	---	2 (4F) 5G 46.4%	2 (4F) 3G 17.2%
4.0	4	2319.394	---	2 (4F) 3F 37.2%	2 (4F) 5D 32.9%
4.0	5	2330.922	---	2 (4F) 5F 46.2%	2 (4F) 5G 13.4%
4.0	6	2340.913	---	2 (4F) 3F 31.8%	2 (2G) 3F 26.5%
4.0	7	2348.948	---	2 (4F) 3G 48.6%	2 (4F) 5G 30.4%
4.0	8	2353.369	---	2 (2G) 3H 63.9%	2 (2G) 1G 10.4%
4.0	9	2371.188	---	2 (4P) 5D 80.8%	2 (4F) 5D 4.1%
4.0	10	2376.751	---	2 (2G) 3F 30.5%	2 (2G) 1G 22.3%
4.0	11	2382.982	---	2 (2H) 3G 59.6%	2 (2G) 3G 11.8%
4.0	12	2392.720	---	2 (2G) 3G 43.1%	2 (2G) 3H 20.2%
4.0	13	2407.616	---	2 (2D) 3F 62.3%	2 (2D) 3F 15.1%
4.0	14	2413.807	---	2 (2G) 1G 41.5%	2 (2H) 1G 39.5%
4.0	15	2418.300	---	2 (2H) 3H 39.1%	2 (2F) 3G 25.6%

J	NO	ENERGY(KK)		LEADING PERCENTAGES	
4.0	16	2429.916	---	2 (2H) 3H 28.8%	2 (2F) 1G 18.4%
4.0	17	2449.768	---	2 (2F) 1G 46.7%	2 (2F) 3G 36.8%
4.0	18	2459.662	---	2 (2F) 3F 66.0%	2 (2F) 1G 13.9%
4.0	19	2521.976	---	2 (2D) 3F 67.5%	2 (2D) 3F 22.3%
5.0	1	2274.064	---	2 (4F) 5F 40.9%	2 (4F) 3G 27.5%
5.0	2	2310.795	---	2 (4F) 5F 52.2%	2 (4F) 3G 30.8%
5.0	3	2335.177	---	2 (4F) 5G 64.1%	2 (4F) 3G 17.9%
5.0	4	2337.081	---	2 (2G) 3H 30.0%	2 (4F) 3G 17.9%
5.0	5	2357.868	---	2 (2H) 3G 77.9%	2 (2H) 3H 9.4%
5.0	6	2376.606	---	2 (2H) 3I 56.6%	2 (2G) 3G 36.7%
5.0	7	2383.215	---	2 (2G) 1H 24.8%	2 (2G) 3G 22.0%
5.0	8	2395.983	---	2 (2G) 3H 43.7%	2 (2G) 1H 42.6%
5.0	9	2410.375	---	2 (2H) 3H 50.6%	2 (2H) 1H 26.6%
5.0	10	2436.053	---	2 (2H) 1H 56.9%	2 (2H) 3H 19.0%
5.0	11	2458.266	---	2 (2F) 3G 88.1%	2 (2H) 3G 4.9%
6.0	1	2311.109	---	2 (4F) 5G 91.6%	2 (2G) 3H 8.1%
6.0	2	2357.003	---	2 (2H) 3I 53.1%	2 (2H) 1I 30.0%
6.0	3	2373.407	---	2 (2G) 3H 69.3%	2 (2H) 1I 19.1%
6.0	4	2407.397	---	2 (2H) 3H 84.3%	2 (2H) 1I 8.5%
6.0	5	2417.022	---	2 (2H) 1I 42.3%	2 (2H) 3I 35.7%
7.0	1	2391.280	---	2 (2H) 3I100.0%	



Mo XVII　スペクトル・パターン
$(3d)^8 - (3p)^5\,(3d)^9$



Mo XVII　スペクトル・パターン
$(3d)^8 - (3d)^7\,(4p)$

Mo XVII　波長，振動子強度

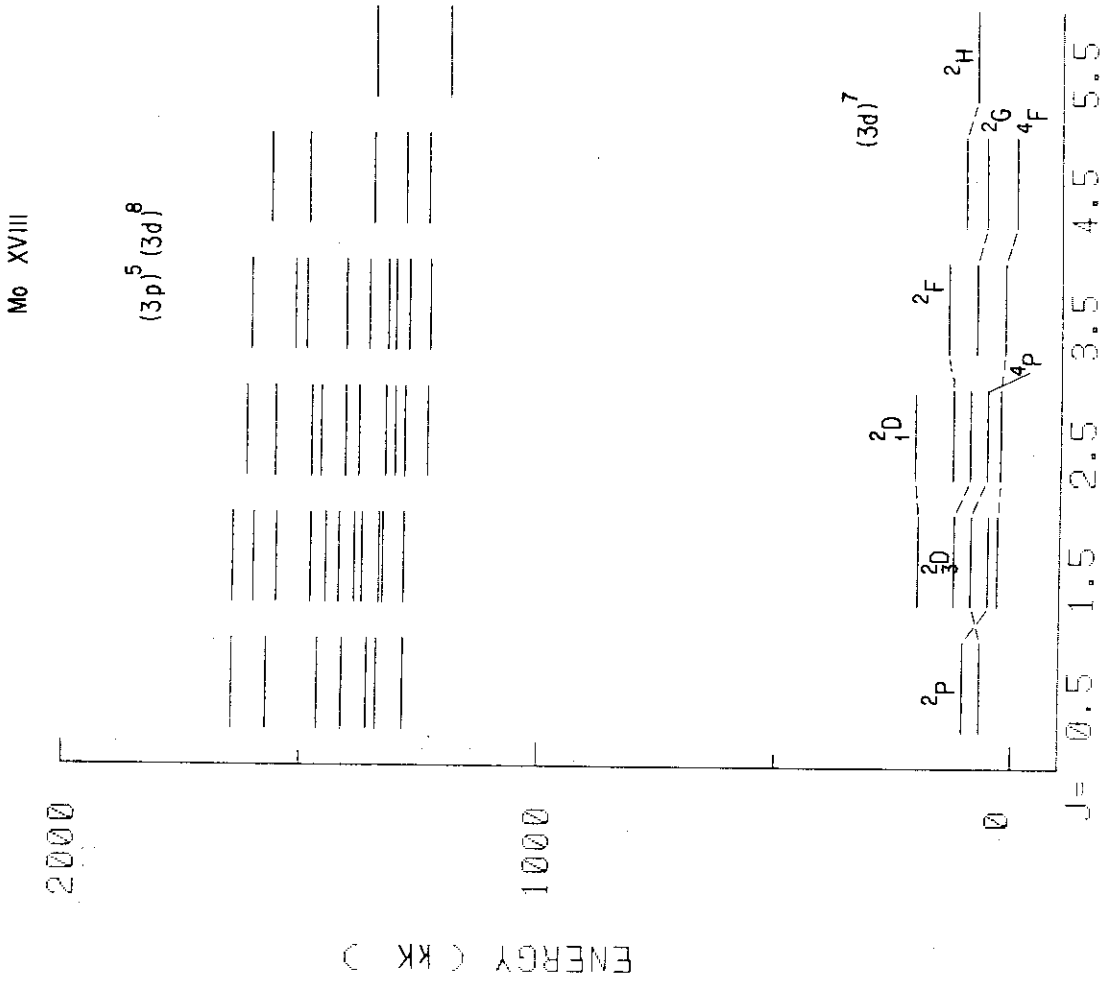
$(3d)^8 - (3p)^5\,(3d)^9$

$(3d)^8 - (3d)^7\,(4p)$

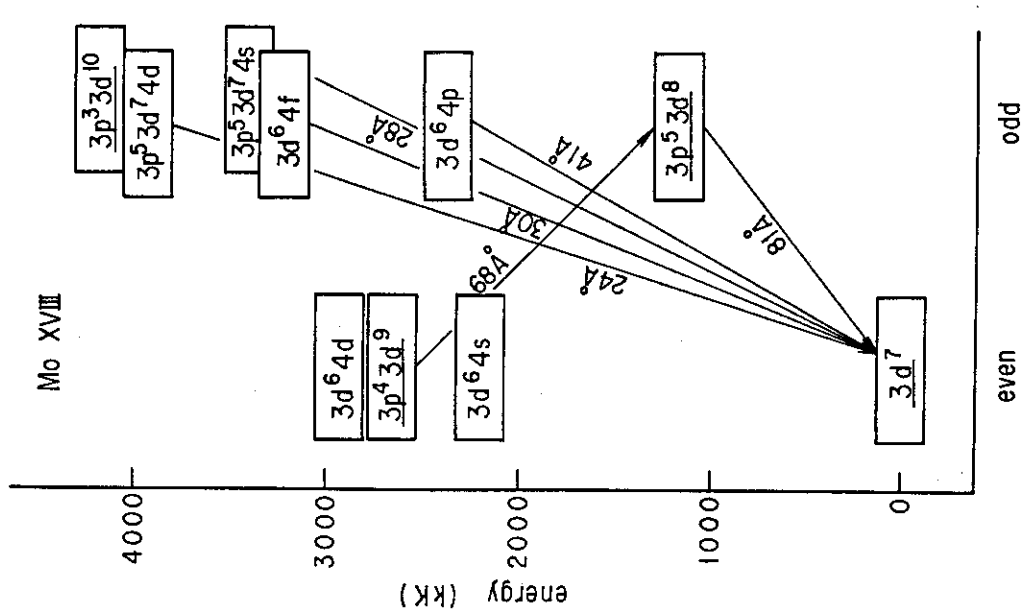
NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
1	78.168	2.0	1281.703	2.0	83.089	0.1533	0.1481E+12
2	69.331	1.0	1281.703	2.0	82.483	0.0539	0.5285E+11
3	178.173	0.0	1394.252	1.0	82.232	0.0669	0.6602E+11
4	81.460	4.0	1310.611	3.0	81.357	0.0722	0.7277E+11
5	50.622	2.0	1281.703	2.0	81.229	0.2006	0.2028E+12
6	78.168	2.0	1310.611	3.0	81.140	0.0944	0.9567E+11
7	23.205	3.0	1261.418	4.0	80.762	0.0833	0.8521E+11
8	26.595	2.0	1281.703	2.0	79.674	0.8306	0.8727E+12
9	-0.661	4.0	1261.418	4.0	79.234	1.2500	0.1328E+13
10	78.168	2.0	1344.124	2.0	78.992	0.2501	0.2674E+12
11	26.595	2.0	1310.611	3.0	77.881	0.0630	0.6930E+11
12	69.331	1.0	1354.925	1.0	77.785	0.3321	0.3660E+12
13	67.675	0.0	1354.925	1.0	77.685	0.1874	0.2071E+12
14	23.205	3.0	1310.611	3.0	77.676	0.2563	0.2833E+12
15	81.460	4.0	1370.750	3.0	77.562	0.4210	0.4667E+12
16	69.331	1.0	1359.290	0.0	77.522	0.3472	0.3854E+12
17	50.622	2.0	1344.124	2.0	77.309	0.4030	0.4497E+12
18	50.622	2.0	1354.925	1.0	76.669	0.5597	0.6351E+12
19	-0.661	4.0	1310.611	3.0	76.262	1.3638	0.1564E+13
20	26.595	2.0	1344.124	2.0	75.900	0.0626	0.7248E+11
21	50.622	2.0	1370.750	3.0	75.750	0.3371	0.3919E+12
22	23.205	3.0	1344.124	2.0	75.705	1.2639	0.1471E+13
23	67.675	0.0	1394.252	1.0	75.382	0.2458	0.2885E+12
24	50.622	2.0	1394.252	1.0	74.425	0.0749	0.9016E+11
25	23.205	3.0	1370.750	3.0	74.209	0.7620	0.9229E+12
26	78.168	2.0	1445.185	2.0	73.152	0.8028	0.1001E+13
27	26.595	2.0	1394.252	1.0	73.118	1.0723	0.1338E+13
28	-0.661	4.0	1370.750	3.0	72.918	1.6181	0.2030E+13
29	178.173	0.0	1566.632	1.0	72.022	0.4212	0.5416E+12
30	50.622	2.0	1445.185	2.0	71.707	0.1456	0.1889E+12
31	78.168	2.0	1473.466	2.0	71.669	0.2134	0.2771E+12
32	69.331	1.0	1473.466	2.0	71.218	0.6932	0.9115E+12
33	26.595	2.0	1445.185	2.0	70.493	0.1898	0.2548E+12
34	50.622	2.0	1473.466	2.0	70.282	0.4055	0.5476E+12
35	26.595	2.0	1473.466	2.0	69.115	0.1001	0.1397E+12
36	23.205	3.0	1473.466	2.0	68.953	0.8113	0.1138E+13
37	81.460	4.0	1542.077	3.0	68.464	4.1275	0.5873E+13
38	78.168	2.0	1542.077	3.0	68.310	0.1418	0.2027E+12
39	78.168	2.0	1566.632	1.0	67.183	0.7766	0.1148E+13
40	67.675	0.0	1566.632	1.0	66.713	0.0421	0.6304E+11
41	26.595	2.0	1542.077	3.0	65.986	0.0597	0.9146E+11
42	50.622	2.0	1566.632	1.0	65.963	0.2423	0.3715E+12
43	23.205	3.0	1542.077	3.0	65.838	0.1902	0.2926E+12
44	50.622	2.0	2333.790	3.0	43.799	0.0457	0.1588E+12
45	69.331	1.0	2366.800	2.0	43.526	0.0494	0.1738E+12
46	50.622	2.0	2348.658	3.0	43.515	0.0818	0.2880E+12
47	81.460	4.0	2383.214	5.0	43.445	0.0921	0.3255E+12
48	69.331	1.0	2375.996	2.0	43.353	0.0808	0.2867E+12
49	26.595	2.0	2333.790	3.0	43.343	0.0508	0.1803E+12
50	178.173	0.0	2486.914	1.0	43.314	0.0519	0.1846E+12

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
51	23.205	3.0	2333.790	3.0	43.279	0.0694	0.2473E+12
52	81.460	4.0	2392.719	4.0	43.266	0.0878	0.3129E+12
53	-0.661	4.0	2310.795	5.0	43.263	0.0409	0.1458E+12
54	81.460	4.0	2395.983	5.0	43.205	0.0850	0.3037E+12
55	69.331	1.0	2384.298	1.0	43.197	0.0482	0.1723E+12
56	50.622	2.0	2366.800	2.0	43.175	0.0787	0.2815E+12
57	69.331	1.0	2388.156	1.0	43.125	0.1018	0.3652E+12
58	-0.661	4.0	2319.393	4.0	43.102	0.1963	0.7048E+12
59	-0.661	4.0	2323.385	3.0	43.028	0.1512	0.5446E+12
60	23.205	3.0	2348.658	3.0	43.002	0.0629	0.2269E+12
61	26.595	2.0	2353.774	1.0	42.970	0.0424	0.1530E+12
62	81.460	4.0	2410.374	5.0	42.938	0.1662	0.6014E+12
63	26.595	2.0	2357.342	2.0	42.905	0.1318	0.4774E+12
64	81.460	4.0	2413.220	3.0	42.886	0.1373	0.4978E+12
65	50.622	2.0	2382.601	1.0	42.882	0.0455	0.1652E+12
66	81.460	4.0	2413.807	4.0	42.875	1.2978	0.4709E+13
67	67.675	0.0	2400.398	1.0	42.868	0.0646	0.2345E+12
68	78.168	2.0	2411.138	2.0	42.864	0.0880	0.3193E+12
69	26.595	2.0	2360.014	1.0	42.856	0.0758	0.2754E+12
70	50.622	2.0	2384.298	1.0	42.851	0.0460	0.1673E+12
71	26.595	2.0	2360.593	3.0	42.845	0.1637	0.5949E+12
72	23.205	3.0	2357.342	2.0	42.842	0.0901	0.3273E+12
73	-0.661	4.0	2333.790	3.0	42.837	0.1097	0.3986E+12
74	78.168	2.0	2413.220	3.0	42.826	0.2250	0.8184E+12
75	78.168	2.0	2415.314	1.0	42.787	0.0548	0.1996E+12
76	23.205	3.0	2360.593	3.0	42.783	0.0521	0.1898E+12
77	178.173	0.0	2515.835	1.0	42.778	0.0560	0.2042E+12
78	-0.661	4.0	2337.080	5.0	42.776	0.0425	0.1549E+12
79	-0.661	4.0	2340.913	4.0	42.706	0.6231	0.2279E+13
80	78.168	2.0	2420.424	3.0	42.694	0.0775	0.2836E+12
81	23.205	3.0	2366.800	2.0	42.669	0.0899	0.3292E+12
82	50.622	2.0	2394.655	2.0	42.662	0.0645	0.2362E+12
83	23.205	3.0	2368.968	3.0	42.630	0.1703	0.6250E+12
84	-0.661	4.0	2346.310	3.0	42.608	0.0917	0.3370E+12
85	78.168	2.0	2425.942	2.0	42.594	0.1934	0.7111E+12
86	50.622	2.0	2398.743	3.0	42.587	0.0969	0.3562E+12
87	50.622	2.0	2399.112	1.0	42.581	0.1673	0.6155E+12
88	78.168	2.0	2427.053	3.0	42.573	0.0485	0.1787E+12
89	-0.661	4.0	2348.658	3.0	42.566	0.0872	0.3211E+12
90	-0.661	4.0	2348.948	4.0	42.560	0.0802	0.2952E+12
91	26.595	2.0	2377.356	3.0	42.539	0.2414	0.8899E+12
92	23.205	3.0	2374.715	3.0	42.526	0.1315	0.4851E+12
93	78.168	2.0	2430.298	1.0	42.515	0.2289	0.8446E+12
94	23.205	3.0	2375.996	2.0	42.503	0.0859	0.3173E+12
95	50.622	2.0	2403.767	3.0	42.496	0.1058	0.3909E+12
96	178.173	0.0	2531.419	1.0	42.495	0.1977	0.7302E+12
97	50.622	2.0	2404.452	2.0	42.484	0.0973	0.3596E+12
98	-0.661	4.0	2353.369	4.0	42.480	0.0817	0.3021E+12
99	23.205	3.0	2377.356	3.0	42.478	0.0892	0.3296E+12
100	81.460	4.0	2436.053	5.0	42.470	0.2894	0.1070E+13

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
101	26.595	2.0	2382.430	2.0	42.448	0.0419	0.1550E+12
102	26.595	2.0	2382.601	1.0	42.445	0.1784	0.6604E+12
103	-0.661	4.0	2356.332	3.0	42.427	0.0864	0.3201E+12
104	-0.661	4.0	2357.868	5.0	42.399	0.6512	0.2416E+13
105	23.205	3.0	2382.430	2.0	42.387	0.1400	0.5198E+12
106	23.205	3.0	2382.982	4.0	42.377	0.5792	0.2151E+13
107	50.622	2.0	2411.138	2.0	42.364	0.1907	0.7086E+12
108	-0.661	4.0	2360.593	3.0	42.350	0.0505	0.1877E+12
109	50.622	2.0	2415.314	1.0	42.289	0.0455	0.1699E+12
110	69.331	1.0	2435.218	2.0	42.267	0.0611	0.2281E+12
111	26.595	2.0	2393.469	2.0	42.250	0.2983	0.1114E+13
112	78.168	2.0	2445.305	1.0	42.245	0.0758	0.2834E+12
113	23.205	3.0	2391.506	3.0	42.224	0.2055	0.7688E+12
114	81.460	4.0	2449.767	4.0	42.224	0.0447	0.1674E+12
115	81.460	4.0	2450.319	3.0	42.214	0.1715	0.6418E+12
116	78.168	2.0	2447.512	3.0	42.206	0.0770	0.2884E+12
117	23.205	3.0	2394.655	2.0	42.168	0.1257	0.4716E+12
118	78.168	2.0	2450.319	3.0	42.156	0.0563	0.2114E+12
119	-0.661	4.0	2374.715	3.0	42.099	0.1803	0.6784E+12
120	69.331	1.0	2445.305	1.0	42.088	0.1106	0.4165E+12
121	50.622	2.0	2427.053	3.0	42.080	0.2720	0.1025E+13
122	69.331	1.0	2446.070	2.0	42.074	0.0489	0.1844E+12
123	-0.661	4.0	2376.750	4.0	42.063	0.0949	0.3578E+12
124	78.168	2.0	2457.294	2.0	42.032	0.0885	0.3340E+12
125	-0.661	4.0	2383.214	5.0	41.949	0.0529	0.2005E+12
126	67.675	0.0	2451.608	1.0	41.947	0.0921	0.3491E+12
127	-0.661	4.0	2385.507	3.0	41.908	0.1647	0.6255E+12
128	23.205	3.0	2411.138	2.0	41.877	0.0467	0.1775E+12
129	69.331	1.0	2457.294	2.0	41.877	0.0812	0.3089E+12
130	81.460	4.0	2472.544	3.0	41.822	0.4109	0.1567E+13
131	26.595	2.0	2419.115	1.0	41.797	0.0483	0.1844E+12
132	78.168	2.0	2472.544	3.0	41.765	0.1095	0.4186E+12
133	78.168	2.0	2483.943	2.0	41.567	0.0685	0.2643E+12
134	81.460	4.0	2492.782	3.0	41.471	0.0485	0.1882E+12
135	69.331	1.0	2483.943	2.0	41.415	0.0778	0.3025E+12
136	50.622	2.0	2483.943	2.0	41.096	0.0400	0.1580E+12
137	81.460	4.0	2519.451	3.0	41.017	0.1557	0.6172E+12



Mo XVIII エネルギーレベル
$(3d)^7$, $(3p)^5(3d)^8$



Mo XVIII グロトリアン・ダイアグラム

Mo XVIII エネルギーレベル

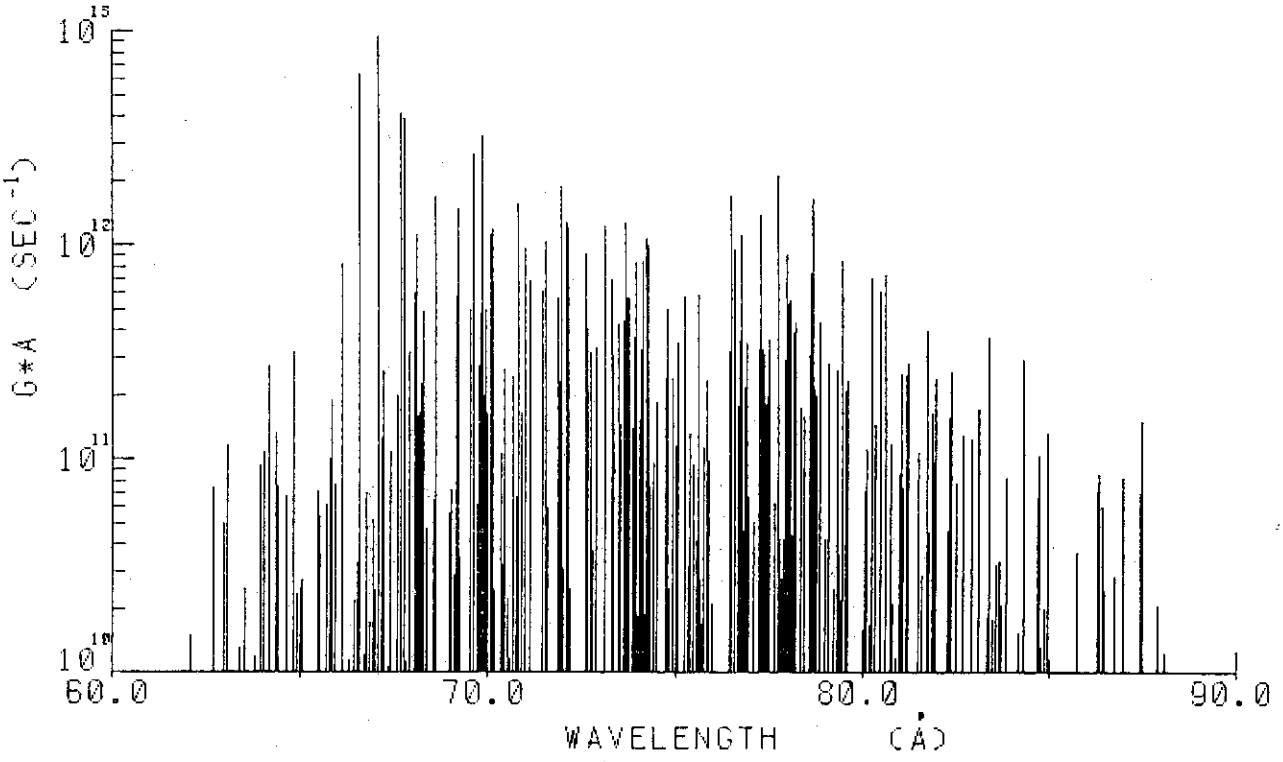
EVEN $(3d)^7$

ODD $(3p)^5\,(3d)^8$

EVEN PARITY

J	NO	ENERGY(KK)		LEADING PERCENTAGES			
0.5	1	70.506	---	1	4P 74.2%	1	2P 25.8%
0.5	2	104.354	---	1	2P 74.2%	1	4P 25.8%
1.5	1	35.327	---	1	4F 76.3%	1	2D 12.3%
1.5	2	52.833	---	1	4P 49.9%	1	2P 37.9%
1.5	3	89.143	---	1	4P 41.4%	1	2P 24.8%
1.5	4	127.804	---	1	2D 55.6%	1	2P 30.3%
1.5	5	200.247	---	1	2D 90.0%	1	2D 8.8%
2.5	1	30.433	---	1	4F 88.8%	1	2D 5.9%
2.5	2	59.482	---	1	4P 90.5%	1	2D 4.1%
2.5	3	93.917	---	1	2D 64.7%	1	2D 19.9%
2.5	4	128.711	---	1	2F 93.9%	1	2D 4.1%
2.5	5	210.935	---	1	2D 70.9%	1	2D 23.4%
3.5	1	20.932	---	1	4F 97.7%	1	2G 2.1%
3.5	2	80.643	---	1	2G 93.9%	1	2F 4.4%
3.5	3	141.402	---	1	2F 95.4%	1	2G 4.0%
4.5	1	-0.778	---	1	4F 91.5%	1	2G 8.2%
4.5	2	61.416	---	1	2G 70.7%	1	2H 21.5%
4.5	3	106.403	---	1	2H 78.2%	1	2G 21.1%
5.5	1	83.318	---	1	2H100.0%		

ODD J	PARITY NO	ENERGY(KK)		LEADING PERCENTAGES	
0.5	1	1284.502	---	1 (3P) 2S 71.6%	1 (3P) 4P 22.9%
0.5	2	1338.344	---	1 (3F) 4D 76.3%	1 (1D) 2P 18.6%
0.5	3	1361.626	---	1 (1D) 2P 51.4%	1 (3P) 4D 20.3%
0.5	4	1412.368	---	1 (3P) 4D 33.9%	1 (1D) 2P 23.3%
0.5	5	1463.893	---	1 (3P) 4P 53.6%	1 (3P) 4D 29.1%
0.5	6	1573.471	---	1 (3P) 2P 57.1%	1 (1S) 2P 21.6%
0.5	7	1645.043	---	1 (1S) 2P 74.5%	1 (3P) 2P 25.2%
1.5	1	1285.121	---	1 (3P) 2D 25.4%	1 (3F) 2D 24.2%
1.5	2	1327.628	---	1 (3P) 4P 30.6%	1 (3F) 4F 23.5%
1.5	3	1336.154	---	1 (3F) 4F 32.2%	1 (3P) 4P 26.0%
1.5	4	1372.714	---	1 (3F) 4D 38.2%	1 (1D) 2D 22.8%
1.5	5	1388.275	---	1 (3P) 4S 26.2%	1 (3P) 4D 22.9%
1.5	6	1420.272	---	1 (3P) 4S 32.8%	1 (1D) 2P 24.3%
1.5	7	1449.497	---	1 (3P) 4D 43.2%	1 (1S) 2P 38.0%
1.5	8	1480.279	---	1 (1S) 2P 26.6%	1 (3P) 4S 20.5%
1.5	9	1554.251	---	1 (1D) 2D 42.9%	1 (1D) 2P 25.0%
1.5	10	1597.336	---	1 (3F) 2D 46.0%	1 (3P) 2D 24.8%
1.5	11	1647.256	---	1 (3P) 2P 60.6%	1 (3P) 2D 13.4%
2.5	1	1238.860	---	1 (1D) 2D 24.7%	1 (3F) 2D 17.3%
2.5	2	1286.897	---	1 (3F) 4G 31.6%	1 (3F) 2F 18.5%
2.5	3	1305.536	---	1 (3P) 4P 44.4%	1 (3P) 4D 26.7%
2.5	4	1323.424	---	1 (3F) 4F 41.9%	1 (3P) 4P 25.3%
2.5	5	1377.653	---	1 (3P) 4D 31.6%	1 (3F) 4D 30.8%
2.5	6	1383.906	---	1 (3F) 4G 33.6%	1 (1D) 2D 19.7%
2.5	7	1409.608	---	1 (1G) 2F 46.4%	1 (3F) 4G 14.3%
2.5	8	1461.131	---	1 (1D) 2F 26.4%	1 (1G) 2F 22.9%
2.5	9	1479.456	---	1 (1D) 2D 21.0%	1 (3F) 2D 18.6%
2.5	10	1558.486	---	1 (1D) 2F 42.2%	1 (3F) 2F 31.6%
2.5	11	1616.382	---	1 (3P) 2D 61.2%	1 (3F) 2D 20.8%
3.5	1	1236.742	---	1 (1D) 2F 38.6%	1 (3F) 2F 28.8%
3.5	2	1279.722	---	1 (3P) 4D 33.1%	1 (3F) 4G 28.5%
3.5	3	1306.314	---	1 (3P) 4D 58.2%	1 (3F) 4F 13.2%
3.5	4	1321.421	---	1 (1G) 2G 30.2%	1 (3F) 4F 20.9%
3.5	5	1363.439	---	1 (1G) 2G 26.4%	1 (1D) 2F 23.5%
3.5	6	1407.851	---	1 (3F) 4D 35.5%	1 (3F) 4F 27.8%
3.5	7	1493.092	---	1 (3F) 2F 41.9%	1 (3F) 4D 20.4%
3.5	8	1518.505	---	1 (3F) 2G 49.0%	1 (1G) 2F 39.2%
3.5	9	1607.968	---	1 (1G) 2F 34.7%	1 (3F) 2G 25.1%
4.5	1	1241.668	---	1 (3F) 4G 83.2%	1 (3F) 4F 15.8%
4.5	2	1285.088	---	1 (3F) 4F 45.9%	1 (1G) 2G 25.7%
4.5	3	1355.412	---	1 (1G) 2G 40.9%	1 (3F) 4F 33.0%
4.5	4	1495.473	---	1 (1G) 2H 73.3%	1 (3F) 2G 13.6%
4.5	5	1573.645	---	1 (3F) 2G 66.1%	1 (1G) 2G 24.2%
5.5	1	1198.788	---	1 (3F) 4G 99.4%	
5.5	2	1354.749	---	1 (1G) 2H 99.4%	



Mo XVIII スペクトル・パターン
$(3d)^7 - (3p)^5\ (3d)^8$

Mo XVIII 波長，振動子強度

$(3d)^7 - (3p)^5\,(3d)^8$

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
1	210.935	2.5	1305.535	2.5	91.358	0.0048	0.3870E+10
2	141.402	3.5	1236.741	3.5	91.296	0.0147	0.1174E+11
3	141.402	3.5	1238.860	2.5	91.120	0.0071	0.5682E+10
4	128.711	2.5	1238.860	2.5	90.078	0.0204	0.1675E+11
5	210.935	2.5	1321.421	3.5	90.051	0.0158	0.1296E+11
6	83.318	5.5	1198.787	5.5	89.648	0.0079	0.6550E+10
7	106.403	4.5	1241.668	4.5	88.085	0.0145	0.1247E+11
8	61.416	4.5	1198.787	5.5	87.922	0.0238	0.2057E+11
9	141.402	3.5	1279.722	3.5	87.849	0.0070	0.6016E+10
10	93.917	2.5	1236.741	3.5	87.503	0.1746	0.1521E+12
11	141.402	3.5	1285.088	4.5	87.437	0.0802	0.6996E+11
12	89.143	1.5	1238.860	2.5	86.978	0.0939	0.8275E+11
13	210.935	2.5	1363.439	3.5	86.768	0.0317	0.2811E+11
14	128.711	2.5	1285.121	1.5	86.475	0.0272	0.2426E+11
15	127.804	1.5	1284.501	0.5	86.453	0.0138	0.1235E+11
16	127.804	1.5	1285.121	1.5	86.407	0.0672	0.6008E+11
17	128.711	2.5	1286.897	2.5	86.342	0.0956	0.8549E+11
18	83.318	5.5	1241.668	4.5	86.330	0.0165	0.1475E+11
19	127.804	1.5	1286.897	2.5	86.274	0.0789	0.7072E+11
20	141.402	3.5	1306.313	3.5	85.844	0.0062	0.5641E+10
21	210.935	2.5	1377.652	2.5	85.711	0.0405	0.3680E+11
22	200.247	1.5	1372.713	1.5	85.290	0.0078	0.7178E+10
23	106.403	4.5	1279.722	3.5	85.228	0.0066	0.6082E+10
24	59.482	2.5	1236.741	3.5	84.943	0.1450	0.1340E+12
25	106.403	4.5	1285.088	4.5	84.840	0.0217	0.2007E+11
26	141.402	3.5	1321.421	3.5	84.744	0.0140	0.1302E+11
27	104.353	0.5	1284.501	0.5	84.735	0.0313	0.2909E+11
28	61.416	4.5	1241.668	4.5	84.728	0.1125	0.1045E+12
29	104.353	0.5	1285.121	1.5	84.691	0.0714	0.6641E+11
30	93.917	2.5	1279.722	3.5	84.331	0.0080	0.7545E+10
31	52.833	1.5	1238.860	2.5	84.315	0.3153	0.2959E+12
32	200.247	1.5	1388.274	1.5	84.173	0.0164	0.1544E+11
33	128.711	2.5	1321.421	3.5	83.843	0.0876	0.8311E+11
34	93.917	2.5	1286.897	2.5	83.824	0.0257	0.2441E+11
35	128.711	2.5	1323.423	2.5	83.702	0.0219	0.2083E+11
36	89.143	1.5	1284.501	0.5	83.657	0.0351	0.3342E+11
37	127.804	1.5	1323.423	2.5	83.639	0.0060	0.5711E+10
38	210.935	2.5	1407.850	3.5	83.548	0.0339	0.3235E+11
39	89.143	1.5	1286.897	2.5	83.490	0.0187	0.1788E+11
40	80.643	3.5	1279.722	3.5	83.397	0.0266	0.2553E+11
41	-0.778	4.5	1198.787	5.5	83.364	0.3881	0.3725E+12
42	127.804	1.5	1327.628	1.5	83.346	0.0137	0.1320E+11
43	106.403	4.5	1306.313	3.5	83.340	0.0189	0.1815E+11
44	35.327	1.5	1238.860	2.5	83.089	0.1774	0.1714E+12
45	80.643	3.5	1286.897	2.5	82.901	0.0584	0.5665E+11
46	30.433	2.5	1236.741	3.5	82.898	0.1291	0.1253E+12
47	210.935	2.5	1420.272	1.5	82.690	0.0077	0.7523E+10
48	200.247	1.5	1409.607	2.5	82.688	0.1351	0.1318E+12
49	127.804	1.5	1338.343	0.5	82.608	0.0073	0.7146E+10
50	200.247	1.5	1412.367	0.5	82.500	0.0405	0.3972E+11

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
51	93.917	2.5	1306.313	3.5	82.481	0.0790	0.7747E+11
52	70.506	0.5	1284.501	0.5	82.373	0.0331	0.3251E+11
53	141.402	3.5	1355.412	4.5	82.372	0.2609	0.2564E+12
54	70.506	0.5	1285.121	1.5	82.331	0.1597	0.1571E+12
55	106.403	4.5	1321.421	3.5	82.303	0.0238	0.2347E+11
56	20.932	3.5	1236.741	3.5	82.250	0.0470	0.4632E+11
57	200.247	1.5	1420.272	1.5	81.966	0.0188	0.1869E+11
58	59.482	2.5	1279.722	3.5	81.951	0.2409	0.2392E+12
59	20.932	3.5	1241.668	4.5	81.918	0.0985	0.9793E+11
60	141.402	3.5	1363.439	3.5	81.831	0.1664	0.1658E+12
61	104.353	0.5	1327.628	1.5	81.748	0.0460	0.4593E+11
62	61.416	4.5	1285.088	4.5	81.721	0.4028	0.4022E+12
63	80.643	3.5	1306.313	3.5	81.588	0.0286	0.2864E+11
64	59.482	2.5	1286.897	2.5	81.472	0.0165	0.1653E+11
65	93.917	2.5	1321.421	3.5	81.466	0.1086	0.1092E+12
66	52.833	1.5	1284.501	0.5	81.191	0.2789	0.2822E+12
67	104.353	0.5	1336.154	1.5	81.182	0.0500	0.5062E+11
68	52.833	1.5	1285.121	1.5	81.150	0.2446	0.2477E+12
69	127.804	1.5	1361.625	0.5	81.049	0.0727	0.7383E+11
70	52.833	1.5	1286.897	2.5	81.033	0.2031	0.2063E+12
71	89.143	1.5	1323.423	2.5	81.019	0.2484	0.2524E+12
72	128.711	2.5	1363.439	3.5	80.990	0.0848	0.8622E+11
73	141.402	3.5	1377.652	2.5	80.890	0.0115	0.1173E+11
74	-0.778	4.5	1236.741	3.5	80.807	0.0207	0.2116E+11
75	89.143	1.5	1327.628	1.5	80.744	0.0437	0.4473E+11
76	210.935	2.5	1449.496	1.5	80.739	0.1166	0.1193E+12
77	80.643	3.5	1321.421	3.5	80.595	0.7243	0.7438E+12
78	93.917	2.5	1336.154	1.5	80.500	0.0062	0.6362E+10
79	-0.778	4.5	1241.668	4.5	80.486	0.5917	0.6092E+12
80	141.402	3.5	1383.906	2.5	80.483	0.1397	0.1439E+12
81	61.416	4.5	1306.313	3.5	80.328	0.1423	0.1471E+12
82	127.804	1.5	1372.713	1.5	80.327	0.0504	0.5214E+11
83	59.482	2.5	1305.535	2.5	80.253	0.6917	0.7163E+12
84	59.482	2.5	1306.313	3.5	80.203	0.0102	0.1060E+11
85	89.143	1.5	1336.154	1.5	80.192	0.0162	0.1683E+11
86	106.403	4.5	1354.748	5.5	80.106	0.1090	0.1133E+12
87	128.711	2.5	1377.652	2.5	80.068	0.0595	0.6190E+11
88	106.403	4.5	1355.412	4.5	80.063	0.0156	0.1627E+11
89	35.327	1.5	1284.501	0.5	80.053	0.0689	0.7168E+11
90	89.143	1.5	1338.343	0.5	80.051	0.0067	0.7010E+10
91	30.433	2.5	1279.722	3.5	80.046	0.0163	0.1696E+11
92	35.327	1.5	1285.121	1.5	80.013	0.0132	0.1376E+11
93	127.804	1.5	1377.652	2.5	80.010	0.0154	0.1605E+11
94	35.327	1.5	1286.897	2.5	79.900	0.0058	0.6087E+10
95	30.433	2.5	1286.897	2.5	79.588	0.2223	0.2341E+12
96	106.403	4.5	1363.439	3.5	79.552	0.2016	0.2125E+12
97	104.353	0.5	1361.625	0.5	79.537	0.1304	0.1375E+12
98	20.932	3.5	1279.722	3.5	79.441	0.8113	0.8575E+12
99	128.711	2.5	1388.274	1.5	79.393	0.0208	0.2202E+11
100	61.416	4.5	1321.421	3.5	79.365	0.0342	0.3620E+11

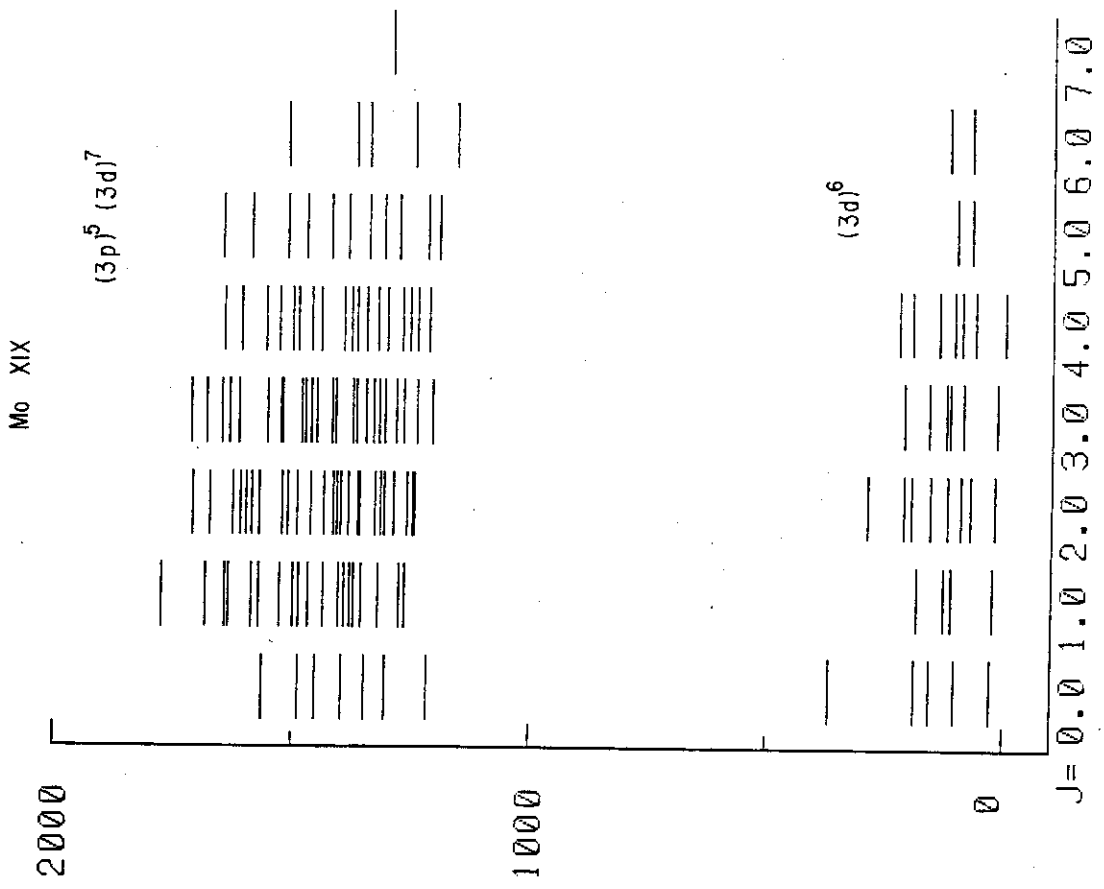
NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
101	127.804	1.5	1388.274	1.5	79.336	0.0196	0.2081E+11
102	200.247	1.5	1461.130	2.5	79.310	0.2501	0.2652E+12
103	59.482	2.5	1321.421	3.5	79.243	0.0235	0.2495E+11
104	59.482	2.5	1323.423	2.5	79.118	0.0078	0.8362E+10
105	20.932	3.5	1285.088	4.5	79.104	0.2635	0.2809E+12
106	70.506	0.5	1336.154	1.5	79.011	0.0400	0.4275E+11
107	20.932	3.5	1286.897	2.5	78.991	0.0244	0.2603E+11
108	141.402	3.5	1407.850	3.5	78.961	0.0081	0.8659E+10
109	70.506	0.5	1338.343	0.5	78.874	0.3575	0.3832E+12
110	59.482	2.5	1327.628	1.5	78.855	0.4107	0.4405E+12
111	141.402	3.5	1409.607	2.5	78.852	0.0713	0.7651E+11
112	104.353	0.5	1372.713	1.5	78.842	0.0178	0.1908E+11
113	210.935	2.5	1480.279	1.5	78.781	0.1853	0.1991E+12
114	93.917	2.5	1363.439	3.5	78.770	0.0571	0.6136E+11
115	35.327	1.5	1305.535	2.5	78.727	0.0116	0.1249E+11
116	52.833	1.5	1323.423	2.5	78.704	0.1994	0.2147E+12
117	83.318	5.5	1354.748	5.5	78.652	1.5523	0.1674E+13
118	83.318	5.5	1355.412	4.5	78.611	0.7017	0.7573E+12
119	89.143	1.5	1361.625	0.5	78.587	0.2881	0.3112E+12
120	80.643	3.5	1355.412	4.5	78.446	0.0071	0.7652E+10
121	52.833	1.5	1327.628	1.5	78.444	0.0064	0.6971E+10
122	30.433	2.5	1305.535	2.5	78.425	0.1478	0.1603E+12
123	30.433	2.5	1306.313	3.5	78.377	0.0081	0.8828E+10
124	59.482	2.5	1336.154	1.5	78.329	0.1602	0.1741E+12
125	93.917	2.5	1372.713	1.5	78.199	0.4026	0.4392E+12
126	128.711	2.5	1407.850	3.5	78.178	0.1016	0.1109E+12
127	200.247	1.5	1479.455	2.5	78.173	0.3608	0.3938E+12
128	200.247	1.5	1480.279	1.5	78.123	0.0406	0.4435E+11
129	128.711	2.5	1409.607	2.5	78.070	0.5084	0.5563E+12
130	127.804	1.5	1409.607	2.5	78.015	0.4936	0.5409E+12
131	210.935	2.5	1493.092	3.5	77.994	0.0119	0.1308E+11
132	80.643	3.5	1363.439	3.5	77.955	0.8341	0.9155E+12
133	52.833	1.5	1336.154	1.5	77.923	0.0343	0.3772E+11
134	89.143	1.5	1372.713	1.5	77.908	0.2685	0.2950E+12
135	93.917	2.5	1377.652	2.5	77.898	0.0388	0.4267E+11
136	104.353	0.5	1388.274	1.5	77.886	0.0168	0.1845E+11
137	127.804	1.5	1412.367	0.5	77.848	0.0251	0.2767E+11
138	20.932	3.5	1305.535	2.5	77.845	0.0065	0.7159E+10
139	20.932	3.5	1306.313	3.5	77.798	0.0385	0.4242E+11
140	-0.778	4.5	1285.088	4.5	77.769	1.9566	0.2158E+13
141	35.327	1.5	1323.423	2.5	77.634	0.0568	0.6284E+11
142	93.917	2.5	1383.906	2.5	77.520	0.3280	0.3640E+12
143	30.433	2.5	1321.421	3.5	77.460	0.1798	0.1999E+12
144	128.711	2.5	1420.272	1.5	77.426	0.1638	0.1823E+12
145	35.327	1.5	1327.628	1.5	77.381	0.2784	0.3101E+12
146	127.804	1.5	1420.272	1.5	77.371	0.0153	0.1710E+11
147	30.433	2.5	1323.423	2.5	77.340	0.2926	0.3262E+12
148	61.416	4.5	1354.748	5.5	77.320	0.0881	0.9825E+11
149	61.416	4.5	1355.412	4.5	77.280	1.2661	0.1414E+13
150	93.917	2.5	1388.274	1.5	77.258	0.2936	0.3280E+12

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
151	89.143	1.5	1383.906	2.5	77.234	0.1133	0.1267E+12
152	80.643	3.5	1377.652	2.5	77.100	0.0275	0.3083E+11
153	30.433	2.5	1327.628	1.5	77.089	0.0454	0.5092E+11
154	89.143	1.5	1388.274	1.5	76.975	0.0595	0.6695E+11
155	20.932	3.5	1321.421	3.5	76.894	0.3135	0.3536E+12
156	35.327	1.5	1336.154	1.5	76.874	0.1930	0.2178E+12
157	106.403	4.5	1407.850	3.5	76.838	0.0413	0.4663E+11
158	61.416	4.5	1363.439	3.5	76.804	0.0099	0.1120E+11
159	70.506	0.5	1372.713	1.5	76.793	0.1484	0.1679E+12
160	20.932	3.5	1323.423	2.5	76.776	0.9972	0.1128E+13
161	35.327	1.5	1338.343	0.5	76.745	0.3167	0.3587E+12
162	80.643	3.5	1383.906	2.5	76.730	0.0519	0.5881E+11
163	59.482	2.5	1363.439	3.5	76.690	0.1563	0.1772E+12
164	30.433	2.5	1336.154	1.5	76.586	0.8594	0.9772E+12
165	-0.778	4.5	1306.313	3.5	76.506	1.5024	0.1712E+13
166	210.935	2.5	1518.505	3.5	76.478	0.4758	0.5426E+12
167	104.353	0.5	1412.367	0.5	76.452	0.2812	0.3209E+12
168	93.917	2.5	1409.607	2.5	76.006	0.0184	0.2126E+11
169	104.353	0.5	1420.272	1.5	75.993	0.0115	0.1331E+11
170	70.506	0.5	1388.274	1.5	75.886	0.0849	0.9833E+11
171	59.482	2.5	1377.652	2.5	75.863	0.2042	0.2366E+12
172	141.402	3.5	1461.130	2.5	75.773	0.0982	0.1141E+12
173	52.833	1.5	1372.713	1.5	75.765	0.0303	0.3517E+11
174	128.711	2.5	1449.496	1.5	75.713	0.0146	0.1694E+11
175	127.804	1.5	1449.496	1.5	75.661	0.0232	0.2705E+11
176	-0.778	4.5	1321.421	3.5	75.632	0.5049	0.5887E+12
177	89.143	1.5	1412.367	0.5	75.573	0.0354	0.4137E+11
178	52.833	1.5	1377.652	2.5	75.482	0.0818	0.9572E+11
179	35.327	1.5	1361.625	0.5	75.398	0.1133	0.1329E+12
180	93.917	2.5	1420.272	1.5	75.395	0.0643	0.7546E+11
181	80.643	3.5	1407.850	3.5	75.346	0.0268	0.3153E+11
182	59.482	2.5	1388.274	1.5	75.256	0.4968	0.5850E+12
183	80.643	3.5	1409.607	2.5	75.247	0.0387	0.4563E+11
184	128.711	2.5	1461.130	2.5	75.052	0.2970	0.3516E+12
185	30.433	2.5	1363.439	3.5	75.018	0.0995	0.1179E+12
186	127.804	1.5	1461.130	2.5	75.000	0.0331	0.3924E+11
187	20.932	3.5	1355.412	4.5	74.936	0.2017	0.2396E+12
188	127.804	1.5	1463.893	0.5	74.845	0.0209	0.2492E+11
189	35.327	1.5	1372.713	1.5	74.773	0.4276	0.5101E+12
190	141.402	3.5	1479.455	2.5	74.736	0.2026	0.2419E+12
191	30.433	2.5	1372.713	1.5	74.500	0.0317	0.3814E+11
192	35.327	1.5	1377.652	2.5	74.498	0.1535	0.1844E+12
193	210.935	2.5	1554.250	1.5	74.443	0.0802	0.9658E+11
194	104.353	0.5	1449.496	1.5	74.342	0.0621	0.7493E+11
195	61.416	4.5	1407.850	3.5	74.270	0.8319	0.1006E+13
196	30.433	2.5	1377.652	2.5	74.227	0.8947	0.1083E+13
197	210.935	2.5	1558.486	2.5	74.209	0.0155	0.1878E+11
198	59.482	2.5	1407.850	3.5	74.164	0.7045	0.8543E+12
199	35.327	1.5	1383.906	2.5	74.152	0.1391	0.1687E+12
200	70.506	0.5	1420.272	1.5	74.087	0.2682	0.3259E+12

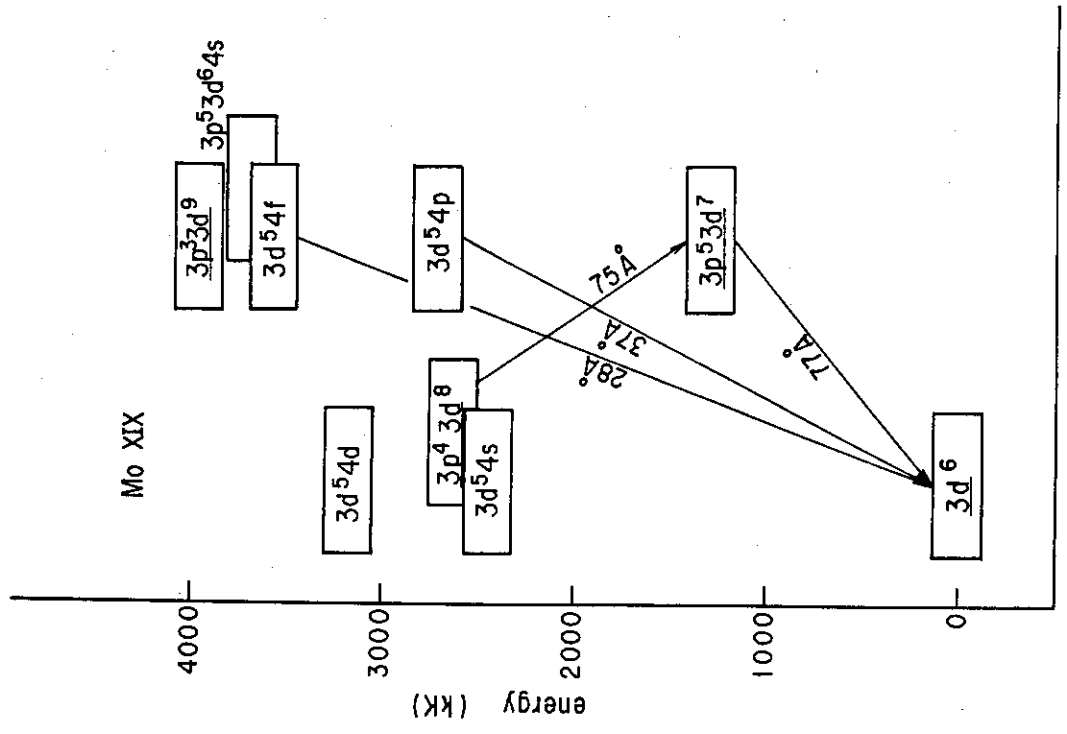
NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
201	128.711	2.5	1479.455	2.5	74.033	0.1256	0.1529E+12
202	128.711	2.5	1480.279	1.5	73.988	0.0152	0.1846E+11
203	127.804	1.5	1479.455	2.5	73.984	0.0113	0.1372E+11
204	141.402	3.5	1493.092	3.5	73.982	0.6927	0.8442E+12
205	35.327	1.5	1388.274	1.5	73.913	0.3075	0.3754E+12
206	30.433	2.5	1383.906	2.5	73.884	0.1146	0.1401E+12
207	200.247	1.5	1554.250	1.5	73.855	0.0094	0.1154E+11
208	141.402	3.5	1495.473	4.5	73.851	0.0752	0.9202E+11
209	93.917	2.5	1449.496	1.5	73.769	0.4650	0.5699E+12
210	-0.778	4.5	1355.412	4.5	73.736	0.4624	0.5672E+12
211	20.932	3.5	1377.652	2.5	73.707	1.0506	0.1290E+13
212	52.833	1.5	1409.607	2.5	73.704	0.0290	0.3555E+11
213	30.433	2.5	1388.274	1.5	73.646	0.3635	0.4471E+12
214	200.247	1.5	1558.486	2.5	73.625	0.1103	0.1357E+12
215	52.833	1.5	1412.367	0.5	73.555	0.1174	0.1447E+12
216	104.353	0.5	1463.893	0.5	73.554	0.0411	0.5061E+11
217	89.143	1.5	1449.496	1.5	73.510	0.0127	0.1565E+11
218	59.482	2.5	1420.272	1.5	73.487	0.3504	0.4328E+12
219	20.932	3.5	1383.906	2.5	73.369	0.2468	0.3058E+12
220	-0.778	4.5	1363.439	3.5	73.302	0.5611	0.6965E+12
221	128.711	2.5	1493.092	3.5	73.293	0.1124	0.1396E+12
222	93.917	2.5	1461.130	2.5	73.141	0.2774	0.3458E+12
223	52.833	1.5	1420.272	1.5	73.129	0.9977	0.1244E+13
224	89.143	1.5	1461.130	2.5	72.887	0.2646	0.3322E+12
225	200.247	1.5	1573.470	0.5	72.821	0.0295	0.3709E+11
226	89.143	1.5	1463.893	0.5	72.741	0.2517	0.3173E+12
227	104.353	0.5	1480.279	1.5	72.678	0.3212	0.4056E+12
228	35.327	1.5	1412.367	0.5	72.620	0.2032	0.2570E+12
229	141.402	3.5	1518.505	3.5	72.616	0.7239	0.9157E+12
230	30.433	2.5	1407.850	3.5	72.600	0.1368	0.1731E+12
231	35.327	1.5	1420.272	1.5	72.205	0.0196	0.2502E+11
232	93.917	2.5	1479.455	2.5	72.174	0.9463	0.1212E+13
233	93.917	2.5	1480.279	1.5	72.131	0.0531	0.6806E+11
234	106.403	4.5	1493.092	3.5	72.114	0.0610	0.7830E+11
235	20.932	3.5	1407.850	3.5	72.102	1.0033	0.1287E+13
236	20.932	3.5	1409.607	2.5	72.011	0.0242	0.3117E+11
237	106.403	4.5	1495.473	4.5	71.991	1.4687	0.1890E+13
238	128.711	2.5	1518.505	3.5	71.953	0.0605	0.7792E+11
239	30.433	2.5	1420.272	1.5	71.951	0.0209	0.2689E+11
240	59.482	2.5	1449.496	1.5	71.942	0.0417	0.5374E+11
241	89.143	1.5	1479.455	2.5	71.926	0.1809	0.2332E+12
242	89.143	1.5	1480.279	1.5	71.884	0.4442	0.5733E+12
243	52.833	1.5	1449.496	1.5	71.599	0.0451	0.5873E+11
244	210.935	2.5	1607.967	3.5	71.580	0.8089	0.1053E+13
245	200.247	1.5	1597.336	1.5	71.577	0.6946	0.9042E+12
246	80.643	3.5	1479.455	2.5	71.489	0.4718	0.6157E+12
247	93.917	2.5	1493.092	3.5	71.471	0.3328	0.4346E+12
248	210.935	2.5	1616.381	2.5	71.152	0.5193	0.6842E+12
249	-0.778	4.5	1407.850	3.5	70.991	0.7412	0.9810E+12
250	70.506	0.5	1480.279	1.5	70.933	0.1260	0.1670E+12

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
251	106.403	4.5	1518.505	3.5	70.816	1.1825	0.1573E+13
252	83.318	5.5	1495.473	4.5	70.814	0.1791	0.2383E+12
253	80.643	3.5	1493.092	3.5	70.799	0.0508	0.6764E+11
254	80.643	3.5	1495.473	4.5	70.680	0.1815	0.2424E+12
255	200.247	1.5	1616.381	2.5	70.615	0.0088	0.1180E+11
256	141.402	3.5	1558.486	2.5	70.567	0.0167	0.2243E+11
257	30.433	2.5	1449.496	1.5	70.469	0.1942	0.2608E+12
258	59.482	2.5	1479.455	2.5	70.424	0.0240	0.3229E+11
259	59.482	2.5	1480.279	1.5	70.383	0.0792	0.1067E+12
260	93.917	2.5	1518.505	3.5	70.196	0.0180	0.2438E+11
261	128.711	2.5	1554.250	1.5	70.149	0.8712	0.1181E+13
262	35.327	1.5	1461.130	2.5	70.136	0.0146	0.1981E+11
263	127.804	1.5	1554.250	1.5	70.104	0.8340	0.1132E+13
264	35.327	1.5	1463.893	0.5	70.000	0.1192	0.1622E+12
265	128.711	2.5	1558.486	2.5	69.941	0.3658	0.4987E+12
266	127.804	1.5	1558.486	2.5	69.897	0.0106	0.1451E+11
267	30.433	2.5	1461.130	2.5	69.896	0.1466	0.2001E+12
268	61.416	4.5	1493.092	3.5	69.848	2.4173	0.3305E+13
269	141.402	3.5	1573.644	4.5	69.821	0.3554	0.4863E+12
270	59.482	2.5	1493.092	3.5	69.754	0.2002	0.2744E+12
271	61.416	4.5	1495.473	4.5	69.732	0.0444	0.6090E+11
272	210.935	2.5	1647.256	1.5	69.622	1.9339	0.2661E+13
273	80.643	3.5	1518.505	3.5	69.548	0.3619	0.4990E+12
274	20.932	3.5	1461.130	2.5	69.435	0.0073	0.1013E+11
275	35.327	1.5	1479.455	2.5	69.246	0.0251	0.3488E+11
276	200.247	1.5	1645.043	0.5	69.214	1.0656	0.1484E+13
277	127.804	1.5	1573.470	0.5	69.172	0.4186	0.5836E+12
278	200.247	1.5	1647.256	1.5	69.108	0.0206	0.2873E+11
279	30.433	2.5	1479.455	2.5	69.012	0.0521	0.7299E+11
280	30.433	2.5	1480.279	1.5	68.973	0.0376	0.5276E+11
281	104.353	0.5	1554.250	1.5	68.970	0.0400	0.5614E+11
282	61.416	4.5	1518.505	3.5	68.630	1.2049	0.1706E+13
283	20.932	3.5	1479.455	2.5	68.563	0.0224	0.3185E+11
284	59.482	2.5	1518.505	3.5	68.539	0.0458	0.6509E+11
285	30.433	2.5	1493.092	3.5	68.369	0.0331	0.4724E+11
286	93.917	2.5	1558.486	2.5	68.279	0.3445	0.4928E+12
287	89.143	1.5	1554.250	1.5	68.254	0.1580	0.2263E+12
288	141.402	3.5	1607.967	3.5	68.187	0.1148	0.1646E+12
289	106.403	4.5	1573.644	4.5	68.155	0.1108	0.1591E+12
290	128.711	2.5	1597.336	1.5	68.091	0.7784	0.1120E+13
291	104.353	0.5	1573.470	0.5	68.068	0.0472	0.6793E+11
292	89.143	1.5	1558.486	2.5	68.058	0.0096	0.1376E+11
293	127.804	1.5	1597.336	1.5	68.049	0.4161	0.5993E+12
294	20.932	3.5	1493.092	3.5	67.927	0.2195	0.3172E+12
295	20.932	3.5	1495.473	4.5	67.818	0.0078	0.1128E+11
296	141.402	3.5	1616.381	2.5	67.798	2.7197	0.3946E+13
297	80.643	3.5	1558.486	2.5	67.666	2.8568	0.4161E+13
298	128.711	2.5	1607.967	3.5	67.602	0.1369	0.1998E+12
299	70.506	0.5	1554.250	1.5	67.397	0.0733	0.1077E+12
300	89.143	1.5	1573.470	0.5	67.371	0.0072	0.1059E+11

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
301	128.711	2.5	1616.381	2.5	67.219	0.1736	0.2562E+12
302	30.433	2.5	1518.505	3.5	67.201	0.0370	0.5459E+11
303	127.804	1.5	1616.381	2.5	67.178	0.0855	0.1264E+12
304	83.318	5.5	1573.644	4.5	67.099	6.4271	0.9521E+13
305	104.353	0.5	1597.336	1.5	66.980	0.0166	0.2462E+11
306	80.643	3.5	1573.644	4.5	66.979	0.0158	0.2345E+11
307	-0.778	4.5	1493.092	3.5	66.940	0.0351	0.5232E+11
308	-0.778	4.5	1495.473	4.5	66.834	0.0115	0.1712E+11
309	20.932	3.5	1518.505	3.5	66.775	0.0469	0.7017E+11
310	59.482	2.5	1558.486	2.5	66.711	0.0081	0.1210E+11
311	106.403	4.5	1607.967	3.5	66.597	4.2276	0.6358E+13
312	70.506	0.5	1573.470	0.5	66.535	0.0219	0.3296E+11
313	52.833	1.5	1558.486	2.5	66.416	0.0144	0.2184E+11
314	89.143	1.5	1597.336	1.5	66.305	0.0075	0.1139E+11
315	61.416	4.5	1573.644	4.5	66.128	0.5446	0.8307E+12
316	127.804	1.5	1645.043	0.5	65.909	0.0496	0.7612E+11
317	128.711	2.5	1647.256	1.5	65.853	0.1219	0.1875E+12
318	35.327	1.5	1554.250	1.5	65.836	0.0161	0.2475E+11
319	127.804	1.5	1647.256	1.5	65.813	0.0661	0.1018E+12
320	93.917	2.5	1616.381	2.5	65.683	0.0399	0.6162E+11
321	70.506	0.5	1597.336	1.5	65.495	0.0349	0.5428E+11
322	89.143	1.5	1616.381	2.5	65.478	0.0460	0.7152E+11
323	80.643	3.5	1607.967	3.5	65.474	0.0077	0.1197E+11
324	20.932	3.5	1558.486	2.5	65.038	0.0172	0.2713E+11
325	35.327	1.5	1573.470	0.5	65.013	0.0157	0.2480E+11
326	104.353	0.5	1645.043	0.5	64.906	0.0148	0.2348E+11
327	104.353	0.5	1647.256	1.5	64.813	0.1991	0.3161E+12
328	61.416	4.5	1607.967	3.5	64.660	0.0423	0.6754E+11
329	20.932	3.5	1573.644	4.5	64.403	0.0465	0.7473E+11
330	93.917	2.5	1647.256	1.5	64.377	0.0823	0.1325E+12
331	89.143	1.5	1647.256	1.5	64.180	0.1689	0.2735E+12
332	35.327	1.5	1597.336	1.5	64.020	0.0672	0.1093E+12
333	52.833	1.5	1616.381	2.5	63.957	0.0575	0.9379E+11
334	30.433	2.5	1597.336	1.5	63.820	0.0073	0.1199E+11
335	-0.778	4.5	1573.644	4.5	63.515	0.0150	0.2484E+11
336	30.433	2.5	1607.967	3.5	63.390	0.0079	0.1304E+11
337	30.433	2.5	1616.381	2.5	63.054	0.0703	0.1180E+12
338	59.482	2.5	1647.256	1.5	62.981	0.0300	0.5045E+11
339	52.833	1.5	1647.256	1.5	62.719	0.0233	0.3945E+11
340	20.932	3.5	1616.381	2.5	62.678	0.0437	0.7426E+11
341	35.327	1.5	1645.043	0.5	62.123	0.0086	0.1482E+11



Mo XIX エネルギーレベル
$(3d)^6$, $(3p)^5(3d)^7$



Mo XIX グロトリアン・ダイアグラム

Mo XIX エネルギーレベル

EVEN $(3d)^6$

ODD $(3p)^5\,(3d)^7$

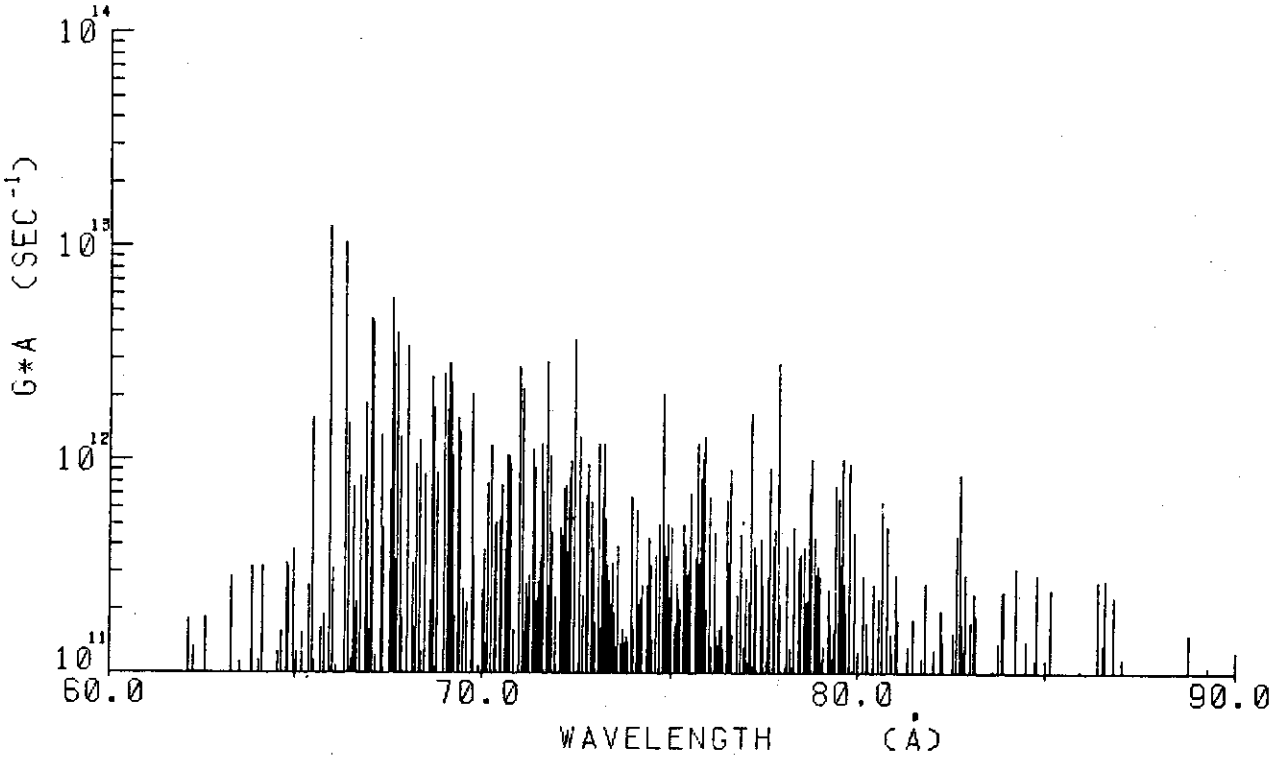
EVEN PARITY

J	NO	ENERGY(KK)		LEADING PERCENTAGES			
0.0	1	28.560	---	1 5D 88.9%	1 3P 6.8%		
0.0	2	106.266	---	1 1S 36.6%	1 3P 23.3%		
0.0	3	156.147	---	1 3P 73.4%	1 1S 12.5%		
0.0	4	189.685	---	1 3P 64.5%	1 1S 30.5%		
0.0	5	371.533	---	1 1S 78.7%	1 1S 19.5%		
1.0	1	26.651	---	1 5D 90.1%	1 3P 5.2%		
1.0	2	112.332	---	1 3P 43.4%	1 3D 38.2%		
1.0	3	129.806	---	1 3D 58.9%	1 3P 21.3%		
1.0	4	187.597	---	1 3P 65.6%	1 3P 31.8%		
2.0	1	20.023	---	1 5D 83.9%	1 3P 6.1%		
2.0	2	75.565	---	1 3P 46.4%	1 3P 27.2%		
2.0	3	92.487	---	1 3F 76.6%	1 3F 9.5%		
2.0	4	120.450	---	1 3D 76.0%	1 3P 7.3%		
2.0	5	158.896	---	1 1D 59.2%	1 1D 12.1%		
2.0	6	198.381	---	1 3F 82.2%	1 3F 13.1%		
2.0	7	215.923	---	1 3P 55.0%	1 3P 34.4%		
2.0	8	290.505	---	1 1D 77.9%	1 1D 20.4%		
3.0	1	16.176	---	1 5D 95.9%	1 3F 2.0%		
3.0	2	88.212	---	1 3F 47.9%	1 3G 30.6%		
3.0	3	118.470	---	1 3G 63.6%	1 3F 30.2%		
3.0	4	125.822	---	1 3D 89.5%	1 3F 3.2%		
3.0	5	160.534	---	1 1F 72.1%	1 3F 20.5%		
3.0	6	212.248	---	1 3F 59.4%	1 1F 21.6%		
4.0	1	0.003	---	1 5D 91.2%	1 3F 5.1%		
4.0	2	64.921	---	1 3H 30.8%	1 3G 22.3%		
4.0	3	95.162	---	1 3H 53.9%	1 3F 29.7%		
4.0	4	111.609	---	1 3G 70.5%	1 1G 11.3%		
4.0	5	143.228	---	1 1G 55.1%	1 3F 15.5%		
4.0	6	196.058	---	1 3F 70.6%	1 3F 17.3%		
4.0	7	225.474	---	1 1G 60.7%	1 1G 27.2%		
5.0	1	75.230	---	1 3H 62.6%	1 3G 37.4%		
5.0	2	106.657	---	1 3G 62.6%	1 3H 37.4%		
6.0	1	73.962	---	1 3H 89.2%	1 1I 10.8%		
6.0	2	123.880	---	1 1I 89.2%	1 3H 10.8%		

ODD J	PARITY NO	ENERGY(KK)		LEADING PERCENTAGES	
0.0	1	1201.354	---	1 (2P) 1S 43.7%	1 (4P) 3P 20.5%
0.0	2	1291.928	---	1 (2P) 1S 33.1%	1 (4F) 5D 29.5%
0.0	3	1333.637	---	1 (4F) 5D 65.4%	1 (4P) 3P 14.0%
0.0	4	1381.309	---	1 (4P) 5D 60.5%	1 (2D) 3P 26.9%
0.0	5	1439.041	---	1 (2D) 3P 50.6%	1 (2P) 3P 28.5%
0.0	6	1473.660	---	1 (2D) 3P 28.9%	1 (2D) 3P 26.8%
0.0	7	1549.230	---	1 (4P) 3P 47.1%	1 (2P) 3P 24.8%
1.0	1	1250.567	---	1 (4P) 3P 29.3%	1 (2D) 3P 18.1%
1.0	2	1261.860	---	1 (4F) 5F 32.5%	1 (4F) 3D 24.8%
1.0	3	1305.624	---	1 (4F) 5D 50.0%	1 (4F) 5F 18.0%
1.0	4	1341.708	---	1 (2D) 3P 21.8%	1 (4P) 5D 16.6%
1.0	5	1359.112	---	1 (4F) 5D 33.0%	1 (2P) 3D 13.7%
1.0	6	1367.109	---	1 (4P) 5P 59.5%	1 (2P) 3P 9.2%
1.0	7	1380.095	---	1 (2D) 3D 34.2%	1 (2D) 1P 22.8%
1.0	8	1392.865	---	1 (4P) 5D 44.0%	1 (2P) 3S 11.7%
1.0	9	1421.260	---	1 (2F) 3D 36.4%	1 (2P) 3D 20.1%
1.0	10	1454.147	---	1 (2D) 3P 32.0%	1 (2D) 3D 27.0%
1.0	11	1474.561	---	1 (2P) 3S 32.1%	1 (2F) 3D 17.5%
1.0	12	1485.159	---	1 (2D) 3D 21.2%	1 (4P) 3P 19.1%
1.0	13	1513.925	---	1 (2D) 3P 28.2%	1 (2D) 3P 18.3%
1.0	14	1557.534	---	1 (2P) 3D 29.3%	1 (4F) 3D 20.0%
1.0	15	1574.775	---	1 (2D) 1P 27.2%	1 (2D) 3D 24.1%
1.0	16	1622.687	---	1 (2P) 1P 52.1%	1 (2P) 3S 10.8%
1.0	17	1632.918	---	1 (4P) 3D 33.3%	1 (4F) 3D 25.9%
1.0	18	1671.979	---	1 (4P) 3S 79.8%	1 (4P) 3P 6.9%
1.0	19	1764.838	---	1 (2D) 1P 62.3%	1 (2D) 1P 21.0%
2.0	1	1229.236	---	1 (2P) 1D 12.9%	1 (2P) 3P 10.3%
2.0	2	1234.404	---	1 (4F) 3D 26.0%	1 (2P) 3D 20.6%
2.0	3	1248.450	---	1 (4F) 5G 30.7%	1 (4F) 5F 13.5%
2.0	4	1276.100	---	1 (4F) 5F 22.4%	1 (4P) 5S 19.8%
2.0	5	1294.828	---	1 (4P) 5S 17.5%	1 (2P) 1D 15.9%
2.0	6	1304.321	---	1 (4P) 5P 28.3%	1 (4F) 5F 16.6%
2.0	7	1315.392	---	1 (2P) 3P 20.0%	1 (4P) 5D 15.8%
2.0	8	1345.906	---	1 (4F) 5G 23.3%	1 (2F) 3F 16.3%
2.0	9	1350.674	---	1 (4F) 5D 28.0%	1 (4P) 5D 14.0%
2.0	10	1369.269	---	1 (2F) 3F 17.6%	1 (2P) 3P 13.4%
2.0	11	1386.940	---	1 (2G) 3F 53.2%	1 (2D) 3D 14.8%
2.0	12	1396.288	---	1 (2F) 3D 26.8%	1 (2D) 1D 21.6%
2.0	13	1402.552	---	1 (4P) 5P 44.3%	1 (4P) 5S 12.1%
2.0	14	1421.142	---	1 (2D) 3D 13.5%	1 (2D) 3D 12.1%
2.0	15	1452.659	---	1 (2D) 3F 16.1%	1 (2D) 1D 12.7%
2.0	16	1478.404	---	1 (2F) 3D 19.9%	1 (2D) 3D 15.7%
2.0	17	1500.728	---	1 (2D) 3F 17.9%	1 (2D) 3D 16.5%
2.0	18	1512.017	---	1 (4F) 3D 26.3%	1 (2P) 3D 17.2%
2.0	19	1559.128	---	1 (2D) 3F 31.4%	1 (2D) 3F 24.0%
2.0	20	1573.741	---	1 (2D) 3P 33.8%	1 (4P) 3P 29.6%
2.0	21	1586.071	---	1 (2D) 3F 27.3%	1 (4F) 3F 17.9%
2.0	22	1599.343	---	1 (2D) 3P 41.0%	1 (2D) 1D 15.7%
2.0	23	1616.751	---	1 (2P) 1D 21.4%	1 (4F) 3F 13.2%

ODD J	PARITY NO	ENERGY(KK)		LEADING PERCENTAGES	
2.0	24	1662.028	---	1 (4P) 3D 23.2%	1 (2D) 3D 17.3%
2.0	25	1698.074	---	1 (2D) 1D 39.8%	1 (2F) 1D 22.5%
3.0	1	1195.498	---	1 (2P) 3D 36.5%	1 (4F) 3D 26.0%
3.0	2	1227.239	---	1 (4F) 5G 49.3%	1 (4F) 5F 18.7%
3.0	3	1256.278	---	1 (4F) 5F 36.1%	1 (4P) 5D 16.2%
3.0	4	1272.499	---	1 (2G) 3G 25.4%	1 (4F) 3G 16.9%
3.0	5	1296.306	---	1 (4P) 5P 36.4%	1 (4P) 5D 20.0%
3.0	6	1307.906	---	1 (4F) 5G 27.0%	1 (2G) 1F 16.9%
3.0	7	1318.877	---	1 (4P) 5P 25.4%	1 (2D) 3D 17.6%
3.0	8	1335.467	---	1 (4P) 5P 15.6%	1 (4P) 5D 15.0%
3.0	9	1356.450	---	1 (2F) 3F 34.0%	1 (4F) 5F 11.6%
3.0	10	1363.818	---	1 (4F) 5D 23.8%	1 (2D) 3D 18.9%
3.0	11	1400.473	---	1 (2D) 3D 19.2%	1 (2D) 3F 13.7%
3.0	12	1406.535	---	1 (2H) 3G 33.3%	1 (2G) 3F 28.4%
3.0	13	1438.339	---	1 (2F) 3G 18.5%	1 (2D) 3F 11.8%
3.0	14	1451.614	---	1 (2D) 3D 38.2%	1 (2D) 3F 13.9%
3.0	15	1462.707	---	1 (4F) 3D 17.2%	1 (2F) 3G 15.2%
3.0	16	1470.782	---	1 (2D) 3D 17.6%	1 (2G) 3F 16.0%
3.0	17	1509.577	---	1 (4F) 3F 21.1%	1 (2F) 3D 20.2%
3.0	18	1514.910	---	1 (2F) 3G 36.2%	1 (2D) 3F 13.4%
3.0	19	1542.071	---	1 (4F) 3G 28.2%	1 (2F) 3D 27.5%
3.0	20	1602.863	---	1 (4F) 3F 30.8%	1 (2D) 1F 13.1%
3.0	21	1621.866	---	1 (2D) 1F 26.0%	1 (2F) 1F 19.3%
3.0	22	1638.260	---	1 (2G) 1F 20.1%	1 (2D) 1F 19.7%
3.0	23	1672.976	---	1 (4P) 3D 33.5%	1 (2D) 3D 16.5%
3.0	24	1704.560	---	1 (2F) 1F 47.0%	1 (2D) 1F 31.3%
4.0	1	1203.978	---	1 (4F) 5G 57.9%	1 (4F) 5F 12.8%
4.0	2	1227.343	---	1 (4P) 5D 64.4%	1 (4F) 5F 13.6%
4.0	3	1243.244	---	1 (2G) 3G 28.7%	1 (4F) 5F 20.8%
4.0	4	1259.314	---	1 (4P) 5D 28.2%	1 (2D) 3F 23.8%
4.0	5	1291.547	---	1 (2G) 3H 16.6%	1 (4F) 5G 11.6%
4.0	6	1312.771	---	1 (2F) 3G 15.9%	1 (2F) 1G 15.1%
4.0	7	1335.150	---	1 (2F) 3F 16.1%	1 (2F) 1G 13.7%
4.0	8	1353.033	---	1 (2H) 3H 22.3%	1 (2H) 3G 20.3%
4.0	9	1365.695	---	1 (4F) 5D 22.3%	1 (2G) 3F 16.7%
4.0	10	1382.523	---	1 (4F) 5D 35.4%	1 (2G) 1G 18.4%
4.0	11	1432.575	---	1 (2F) 3G 21.1%	1 (2H) 3G 16.7%
4.0	12	1449.495	---	1 (2D) 3F 55.3%	1 (2D) 3F 31.7%
4.0	13	1479.749	---	1 (2G) 3H 28.7%	1 (2G) 1G 17.8%
4.0	14	1492.192	---	1 (2F) 3G 26.9%	1 (2H) 3G 11.5%
4.0	15	1520.797	---	1 (2G) 3F 30.7%	1 (2G) 1G 19.7%
4.0	16	1545.451	---	1 (4F) 3G 29.2%	1 (2H) 3G 15.1%
4.0	17	1597.002	---	1 (4F) 3F 32.7%	1 (4F) 3G 22.1%
4.0	18	1634.521	---	1 (2H) 1G 35.8%	1 (2F) 1G 25.5%
5.0	1	1183.660	---	1 (4F) 5G 84.8%	1 (4F) 5F 12.8%
5.0	2	1208.687	---	1 (4F) 5F 39.5%	1 (2G) 3G 26.5%
5.0	3	1267.345	---	1 (2G) 3H 43.4%	1 (2H) 3H 22.8%
5.0	4	1299.086	---	1 (2G) 1H 30.1%	1 (2H) 1H 22.0%
5.0	5	1331.268	---	1 (2H) 3H 28.0%	1 (2H) 3I 21.1%

ODD J	PARITY NO	ENERGY(KK)		LEADING PERCENTAGES	
5.0	6	1376.297	---	1 (2F) 3G 74.1%	1 (2G) 3H 10.6%
5.0	7	1412.429	---	1 (2H) 3H 21.0%	1 (2H) 3I 19.8%
5.0	8	1461.802	---	1 (2H) 3I 40.1%	1 (2G) 1H 21.1%
5.0	9	1501.426	---	1 (2H) 3G 42.8%	1 (2H) 3H 18.2%
5.0	10	1580.813	---	1 (4F) 3G 47.9%	1 (2H) 3G 18.0%
5.0	11	1640.869	---	1 (2H) 1H 47.6%	1 (2G) 1H 29.7%
6.0	1	1147.136	---	1 (4F) 5G 95.8%	1 (2G) 3H 3.8%
6.0	2	1233.184	---	1 (2G) 3H 65.7%	1 (2H) 3H 21.3%
6.0	3	1330.721	---	1 (2H) 3I 61.2%	1 (2G) 3H 23.9%
6.0	4	1358.035	---	1 (2H) 3H 46.9%	1 (2H) 1I 33.2%
6.0	5	1504.591	---	1 (2H) 1I 65.4%	1 (2H) 3H 18.2%
7.0	1	1284.105	---	1 (2H) 3I100.0%	



Mo XIX　スペクトル・パターン
$(3d)^6 - (3p)^5\ (3d)^7$

Mo XIX　波長，振動子強度

$(3d)^6 - (3p)^5\ (3d)^7$

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
1	75.565	2.0	1195.497	3.0	89.291	0.1281	0.1072E+12
2	106.657	5.0	1233.183	6.0	88.769	0.1798	0.1522E+12
3	64.921	4.0	1208.687	5.0	87.431	0.1016	0.8864E+11
4	158.896	2.0	1307.905	3.0	87.032	0.1335	0.1176E+12
5	120.450	2.0	1272.499	3.0	86.802	0.0897	0.7944E+11
6	160.534	3.0	1312.771	4.0	86.788	0.2547	0.2255E+12
7	88.212	3.0	1243.243	4.0	86.578	0.3061	0.2724E+12
8	111.609	4.0	1267.344	5.0	86.525	0.1519	0.1354E+12
9	75.230	5.0	1233.183	6.0	86.359	0.2971	0.2657E+12
10	92.487	2.0	1256.278	3.0	85.926	0.1131	0.1022E+12
11	160.534	3.0	1335.150	4.0	85.134	0.2674	0.2461E+12
12	92.487	2.0	1272.499	3.0	84.745	0.3079	0.2859E+12
13	196.058	4.0	1376.296	5.0	84.729	0.1239	0.1151E+12
14	0.003	4.0	1183.659	5.0	84.484	0.1511	0.1412E+12
15	120.450	2.0	1307.905	3.0	84.214	0.1069	0.1005E+12
16	111.609	4.0	1299.086	5.0	84.212	0.3325	0.3127E+12
17	16.176	3.0	1203.977	4.0	84.189	0.0860	0.8093E+11
18	143.227	4.0	1331.268	5.0	84.172	0.0929	0.8750E+11
19	143.227	4.0	1335.150	4.0	83.898	0.0817	0.7739E+11
20	75.230	5.0	1267.344	5.0	83.885	0.2545	0.2412E+12
21	160.534	3.0	1353.033	4.0	83.858	0.1689	0.1602E+12
22	125.821	3.0	1318.876	3.0	83.818	0.2500	0.2374E+12
23	118.470	3.0	1312.771	4.0	83.731	0.1449	0.1378E+12
24	95.162	4.0	1291.547	4.0	83.585	0.1068	0.1020E+12
25	64.921	4.0	1267.344	5.0	83.165	0.1918	0.1850E+12
26	88.212	3.0	1291.547	4.0	83.102	0.2438	0.2354E+12
27	196.058	4.0	1400.473	3.0	83.028	0.0867	0.8387E+11
28	158.896	2.0	1363.818	3.0	82.993	0.1786	0.1729E+12
29	123.880	6.0	1330.721	6.0	82.861	0.2987	0.2901E+12
30	225.473	4.0	1432.574	4.0	82.843	0.1289	0.1252E+12
31	20.023	2.0	1227.238	3.0	82.835	0.1024	0.9953E+11
32	123.880	6.0	1331.268	5.0	82.823	0.0874	0.8493E+11
33	26.651	1.0	1234.404	2.0	82.798	0.1211	0.1178E+12
34	198.380	2.0	1406.534	3.0	82.771	0.1721	0.1675E+12
35	0.003	4.0	1208.687	5.0	82.735	0.8778	0.8553E+12
36	187.597	1.0	1396.288	2.0	82.734	0.0869	0.8463E+11
37	160.534	3.0	1369.268	2.0	82.731	0.1424	0.1387E+12
38	73.962	6.0	1284.104	7.0	82.635	0.4509	0.4404E+12
39	16.176	3.0	1227.343	4.0	82.565	0.1563	0.1530E+12
40	92.487	2.0	1307.905	3.0	82.276	0.1430	0.1409E+12
41	129.806	1.0	1345.905	2.0	82.230	0.1438	0.1418E+12
42	196.058	4.0	1412.428	5.0	82.212	0.1994	0.1968E+12
43	75.565	2.0	1294.828	2.0	82.017	0.1298	0.1287E+12
44	158.896	2.0	1380.094	1.0	81.887	0.0836	0.8314E+11
45	143.227	4.0	1365.694	4.0	81.802	0.2627	0.2618E+12
46	26.651	1.0	1250.567	1.0	81.705	0.1163	0.1162E+12
47	73.962	6.0	1299.086	5.0	81.624	0.0893	0.8944E+11
48	225.473	4.0	1451.613	3.0	81.557	0.0984	0.9870E+11
49	16.176	3.0	1243.243	4.0	81.495	0.1782	0.1789E+12
50	20.023	2.0	1248.450	2.0	81.405	0.0971	0.9777E+11

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
51	106.657	5.0	1335.150	4.0	81.401	0.0998	0.1005E+12
52	112.332	1.0	1341.708	1.0	81.342	0.1309	0.1320E+12
53	120.450	2.0	1350.673	2.0	81.286	0.0821	0.8284E+11
54	28.560	0.0	1261.860	1.0	81.083	0.1745	0.1770E+12
55	187.597	1.0	1421.259	1.0	81.060	0.1470	0.1493E+12
56	64.921	4.0	1299.086	5.0	81.027	0.2554	0.2595E+12
57	123.880	6.0	1358.034	6.0	81.027	0.2816	0.2861E+12
58	118.470	3.0	1353.033	4.0	81.000	0.2659	0.2703E+12
59	215.923	2.0	1451.613	3.0	80.926	0.1221	0.1244E+12
60	95.162	4.0	1331.268	5.0	80.899	0.1334	0.1359E+12
61	20.023	2.0	1256.278	3.0	80.889	0.1366	0.1393E+12
62	225.473	4.0	1461.801	5.0	80.885	0.1482	0.1511E+12
63	158.896	2.0	1396.288	2.0	80.815	0.4730	0.4831E+12
64	118.470	3.0	1356.450	3.0	80.777	0.1079	0.1103E+12
65	125.821	3.0	1363.818	3.0	80.776	0.1763	0.1802E+12
66	143.227	4.0	1382.522	4.0	80.691	0.0964	0.9873E+11
67	75.565	2.0	1315.391	2.0	80.657	0.6207	0.6364E+12
68	125.821	3.0	1365.694	4.0	80.653	0.2274	0.2332E+12
69	198.380	2.0	1438.338	3.0	80.648	0.1406	0.1442E+12
70	16.176	3.0	1256.278	3.0	80.639	0.4397	0.4510E+12
71	158.896	2.0	1400.473	3.0	80.543	0.2187	0.2249E+12
72	0.003	4.0	1243.243	4.0	80.435	0.2526	0.2604E+12
73	75.565	2.0	1318.876	3.0	80.430	0.1675	0.1727E+12
74	111.609	4.0	1356.450	3.0	80.332	0.0895	0.9251E+11
75	118.470	3.0	1363.818	3.0	80.299	0.1179	0.1220E+12
76	160.534	3.0	1406.534	3.0	80.257	0.0952	0.9857E+11
77	106.657	5.0	1353.033	4.0	80.233	0.1662	0.1723E+12
78	64.921	4.0	1312.771	4.0	80.138	0.2734	0.2840E+12
79	129.806	1.0	1380.094	1.0	79.982	0.0867	0.9035E+11
80	106.657	5.0	1358.034	6.0	79.912	0.4355	0.4548E+12
81	111.609	4.0	1363.818	3.0	79.859	0.0990	0.1036E+12
82	198.380	2.0	1451.613	3.0	79.794	0.1822	0.1909E+12
83	196.058	4.0	1449.494	4.0	79.781	0.9138	0.9576E+12
84	111.609	4.0	1365.694	4.0	79.739	0.0815	0.8551E+11
85	215.923	2.0	1470.781	3.0	79.690	0.1843	0.1936E+12
86	75.230	5.0	1330.721	6.0	79.650	0.1121	0.1178E+12
87	196.058	4.0	1451.613	3.0	79.646	0.2485	0.2612E+12
88	75.230	5.0	1331.268	5.0	79.615	0.9296	0.9782E+12
89	20.023	2.0	1276.100	2.0	79.613	0.6320	0.6651E+12
90	73.962	6.0	1330.721	6.0	79.570	0.9625	0.1014E+13
91	129.806	1.0	1386.940	2.0	79.546	0.0856	0.9020E+11
92	73.962	6.0	1331.268	5.0	79.535	0.3072	0.3239E+12
93	95.162	4.0	1353.033	4.0	79.499	0.6249	0.6595E+12
94	0.003	4.0	1259.313	4.0	79.409	0.7138	0.7550E+12
95	120.450	2.0	1380.094	1.0	79.387	0.1336	0.1414E+12
96	75.565	2.0	1335.466	3.0	79.371	0.1462	0.1548E+12
97	160.534	3.0	1421.141	2.0	79.327	0.1111	0.1177E+12
98	95.162	4.0	1356.450	3.0	79.284	0.1584	0.1681E+12
99	215.923	2.0	1478.404	2.0	79.209	0.2296	0.2441E+12
100	111.609	4.0	1376.296	5.0	79.071	0.1243	0.1327E+12

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
101	156.147	0.0	1421.259	1.0	79.044	0.1061	0.1133E+12
102	26.651	1.0	1291.928	0.0	79.034	0.0887	0.9476E+11
103	75.565	2.0	1341.708	1.0	78.980	0.2652	0.2836E+12
104	120.450	2.0	1386.940	2.0	78.958	0.2949	0.3155E+12
105	0.003	4.0	1267.344	5.0	78.905	0.2058	0.2205E+12
106	212.248	3.0	1479.749	4.0	78.895	0.2683	0.2875E+12
107	88.212	3.0	1356.450	3.0	78.850	0.4060	0.4356E+12
108	290.505	2.0	1559.128	2.0	78.826	0.0906	0.9724E+11
109	106.657	5.0	1376.296	5.0	78.763	0.9402	0.1011E+13
110	64.921	4.0	1335.150	4.0	78.726	0.6436	0.6927E+12
111	111.609	4.0	1382.522	4.0	78.684	0.2026	0.2183E+12
112	160.534	3.0	1432.574	4.0	78.614	0.1986	0.2143E+12
113	198.380	2.0	1470.781	3.0	78.592	0.3593	0.3880E+12
114	106.266	0.0	1380.094	1.0	78.504	0.3343	0.3618E+12
115	125.821	3.0	1400.473	3.0	78.453	0.3204	0.3472E+12
116	106.657	5.0	1382.522	4.0	78.378	0.0887	0.9632E+11
117	92.487	2.0	1369.268	2.0	78.322	0.4407	0.4791E+12
118	160.534	3.0	1438.338	3.0	78.259	0.0977	0.1064E+12
119	26.651	1.0	1305.623	1.0	78.188	0.1195	0.1304E+12
120	212.248	3.0	1492.191	4.0	78.128	0.3602	0.3936E+12
121	16.176	3.0	1296.305	3.0	78.117	0.1053	0.1151E+12
122	88.212	3.0	1369.268	2.0	78.061	0.0983	0.1076E+12
123	118.470	3.0	1400.473	3.0	78.003	0.0819	0.8977E+11
124	75.565	2.0	1359.111	1.0	77.909	0.1904	0.2092E+12
125	112.332	1.0	1396.288	2.0	77.884	0.1572	0.1729E+12
126	73.962	6.0	1358.034	6.0	77.877	2.5836	0.2841E+13
127	20.023	2.0	1305.623	1.0	77.785	0.4325	0.4768E+12
128	120.450	2.0	1406.534	3.0	77.755	0.3603	0.3975E+12
129	106.266	0.0	1392.865	1.0	77.724	0.0820	0.9057E+11
130	16.176	3.0	1304.321	2.0	77.631	0.8373	0.9266E+12
131	212.248	3.0	1500.727	2.0	77.611	0.1147	0.1270E+12
132	123.880	6.0	1412.428	5.0	77.607	0.2555	0.2829E+12
133	143.227	4.0	1432.574	4.0	77.559	0.1033	0.1145E+12
134	187.597	1.0	1478.404	2.0	77.471	0.2311	0.2568E+12
135	129.806	1.0	1421.141	2.0	77.439	0.1871	0.2081E+12
136	64.921	4.0	1356.450	3.0	77.428	0.1742	0.1938E+12
137	0.003	4.0	1291.547	4.0	77.427	0.3096	0.3445E+12
138	16.176	3.0	1307.905	3.0	77.416	0.3813	0.4243E+12
139	215.923	2.0	1509.576	3.0	77.300	0.2904	0.3242E+12
140	158.896	2.0	1452.658	2.0	77.294	0.0849	0.9477E+11
141	92.487	2.0	1386.940	2.0	77.253	0.3533	0.3948E+12
142	111.609	4.0	1406.534	3.0	77.225	0.1404	0.1570E+12
143	225.473	4.0	1520.796	4.0	77.201	0.0974	0.1090E+12
144	20.023	2.0	1315.391	2.0	77.198	0.0860	0.9623E+11
145	0.003	4.0	1296.305	3.0	77.143	1.4771	0.1655E+13
146	212.248	3.0	1509.576	3.0	77.081	0.1908	0.2142E+12
147	187.597	1.0	1485.158	1.0	77.068	0.1002	0.1125E+12
148	88.212	3.0	1386.940	2.0	76.998	0.2472	0.2781E+12
149	0.003	4.0	1299.086	5.0	76.977	0.1173	0.1321E+12
150	120.450	2.0	1421.141	2.0	76.882	0.1820	0.2053E+12

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
151	64.921	4.0	1365.694	4.0	76.877	0.3966	0.4476E+12
152	16.176	3.0	1318.876	3.0	76.764	0.2053	0.2323E+12
153	75.565	2.0	1380.094	1.0	76.656	0.1329	0.1509E+12
154	196.058	4.0	1501.425	5.0	76.607	0.7962	0.9049E+12
155	125.821	3.0	1432.574	4.0	76.526	0.2902	0.3305E+12
156	26.651	1.0	1333.636	0.0	76.512	0.2521	0.2872E+12
157	75.230	5.0	1382.522	4.0	76.494	0.5719	0.6519E+12
158	290.505	2.0	1599.343	2.0	76.404	0.0851	0.9729E+11
159	112.332	1.0	1421.259	1.0	76.398	0.1144	0.1308E+12
160	129.806	1.0	1439.040	0.0	76.381	0.1442	0.1648E+12
161	160.534	3.0	1470.781	3.0	76.322	0.1396	0.1598E+12
162	198.380	2.0	1509.576	3.0	76.266	0.1176	0.1349E+12
163	88.212	3.0	1400.473	3.0	76.204	0.1298	0.1491E+12
164	0.003	4.0	1312.771	4.0	76.175	0.3984	0.4579E+12
165	92.487	2.0	1406.534	3.0	76.101	0.1157	0.1333E+12
166	118.470	3.0	1432.574	4.0	76.097	0.0909	0.1046E+12
167	106.266	0.0	1421.259	1.0	76.046	0.0903	0.1042E+12
168	20.023	2.0	1335.466	3.0	76.020	0.5794	0.6687E+12
169	225.473	4.0	1542.070	3.0	75.953	0.1730	0.2000E+12
170	95.162	4.0	1412.428	5.0	75.915	0.3697	0.4279E+12
171	75.565	2.0	1392.865	1.0	75.913	0.0919	0.1064E+12
172	64.921	4.0	1382.522	4.0	75.896	1.1125	0.1288E+13
173	88.212	3.0	1406.534	3.0	75.854	0.8696	0.1008E+13
174	156.147	0.0	1474.560	1.0	75.849	0.1125	0.1304E+12
175	143.227	4.0	1461.801	5.0	75.840	0.4310	0.4998E+12
176	0.003	4.0	1318.876	3.0	75.822	0.5672	0.6580E+12
177	16.176	3.0	1335.150	4.0	75.816	0.2027	0.2352E+12
178	160.534	3.0	1479.749	4.0	75.803	0.0960	0.1115E+12
179	26.651	1.0	1345.905	2.0	75.800	0.0939	0.1090E+12
180	16.176	3.0	1335.466	3.0	75.798	0.7148	0.8298E+12
181	143.227	4.0	1462.707	3.0	75.787	0.0894	0.1039E+12
182	225.473	4.0	1545.450	4.0	75.759	0.2837	0.3296E+12
183	111.609	4.0	1432.574	4.0	75.702	1.0328	0.1202E+13
184	20.023	2.0	1341.708	1.0	75.661	0.2984	0.3477E+12
185	26.651	1.0	1350.673	2.0	75.527	0.5954	0.6962E+12
186	187.597	1.0	1512.017	2.0	75.505	0.2599	0.3040E+12
187	196.058	4.0	1520.796	4.0	75.487	0.1061	0.1242E+12
188	75.565	2.0	1400.473	3.0	75.477	0.1827	0.2139E+12
189	125.821	3.0	1451.613	3.0	75.427	0.2452	0.2874E+12
190	106.657	5.0	1432.574	4.0	75.420	0.1157	0.1356E+12
191	215.923	2.0	1542.070	3.0	75.406	0.3443	0.4039E+12
192	75.565	2.0	1402.552	2.0	75.359	0.4238	0.4977E+12
193	156.147	0.0	1485.158	1.0	75.244	0.1695	0.1996E+12
194	16.176	3.0	1345.905	2.0	75.203	0.1899	0.2239E+12
195	28.560	0.0	1359.111	1.0	75.157	0.2231	0.2634E+12
196	120.450	2.0	1451.613	3.0	75.122	0.1401	0.1656E+12
197	290.505	2.0	1621.865	3.0	75.111	0.1022	0.1209E+12
198	88.212	3.0	1421.141	2.0	75.023	0.1906	0.2259E+12
199	118.470	3.0	1451.613	3.0	75.011	0.1811	0.2146E+12
200	212.248	3.0	1545.450	4.0	75.007	0.4108	0.4870E+12

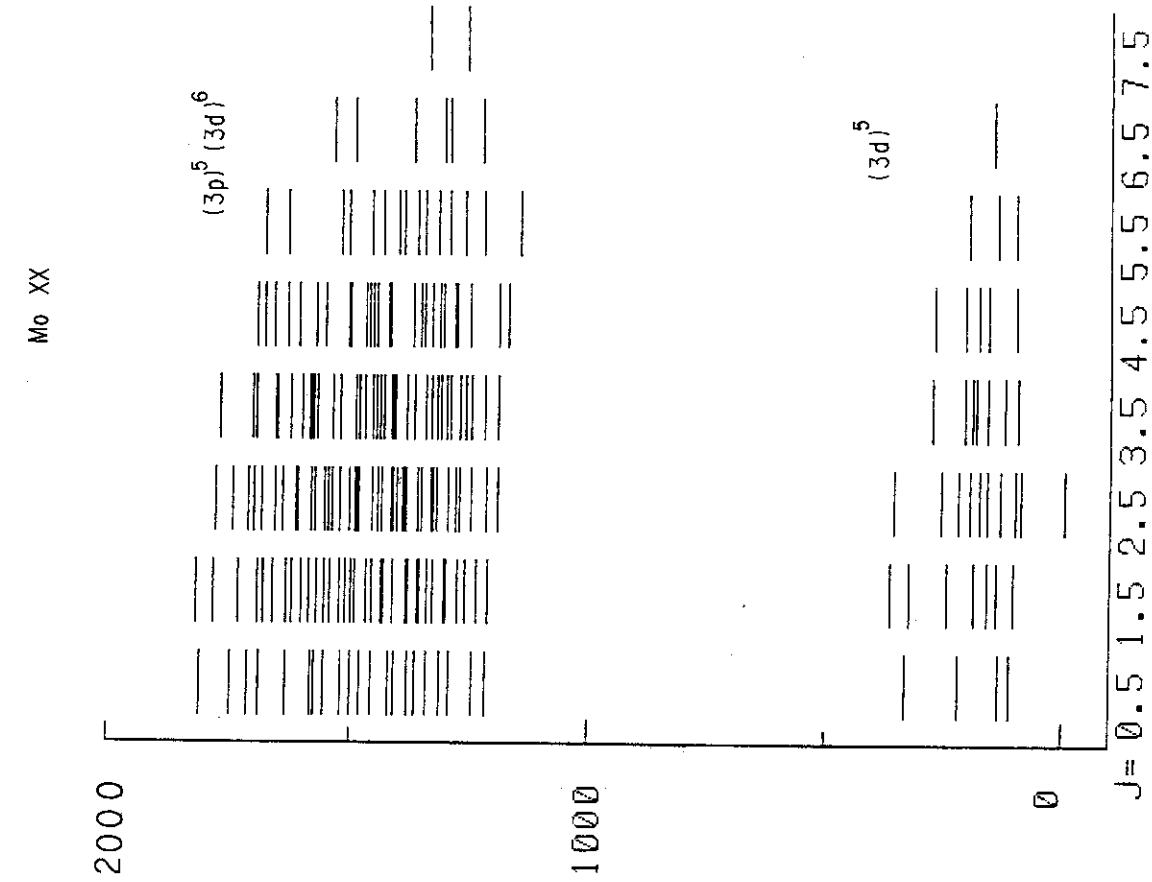
NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
201	120.450	2.0	1454.146	1.0	74.980	0.1900	0.2254E+12
202	16.176	3.0	1350.673	2.0	74.935	0.4187	0.4973E+12
203	0.003	4.0	1335.150	4.0	74.898	0.2273	0.2702E+12
204	64.921	4.0	1400.473	3.0	74.875	0.2955	0.3516E+12
205	20.023	2.0	1356.450	3.0	74.826	0.3152	0.3754E+12
206	143.227	4.0	1479.749	4.0	74.821	0.3290	0.3920E+12
207	125.821	3.0	1462.707	3.0	74.801	0.3389	0.4040E+12
208	75.230	5.0	1412.428	5.0	74.783	1.6972	0.2024E+13
209	95.162	4.0	1432.574	4.0	74.771	0.7085	0.8452E+12
210	73.962	6.0	1412.428	5.0	74.712	0.4212	0.5033E+12
211	28.560	0.0	1367.108	1.0	74.708	0.2018	0.2411E+12
212	20.023	2.0	1359.111	1.0	74.678	0.2092	0.2502E+12
213	16.176	3.0	1356.450	3.0	74.612	0.1295	0.1552E+12
214	112.332	1.0	1452.658	2.0	74.609	0.1260	0.1510E+12
215	26.651	1.0	1367.108	1.0	74.601	0.2990	0.3584E+12
216	64.921	4.0	1406.534	3.0	74.537	0.1185	0.1422E+12
217	26.651	1.0	1369.268	2.0	74.481	0.2684	0.3227E+12
218	106.657	5.0	1449.494	4.0	74.469	0.1096	0.1318E+12
219	20.023	2.0	1363.818	3.0	74.416	0.3585	0.4318E+12
220	118.470	3.0	1462.707	3.0	74.392	0.1204	0.1451E+12
221	129.806	1.0	1474.560	1.0	74.363	0.2136	0.2576E+12
222	75.565	2.0	1421.259	1.0	74.311	0.0843	0.1018E+12
223	20.023	2.0	1367.108	1.0	74.234	0.2124	0.2571E+12
224	16.176	3.0	1363.818	3.0	74.204	0.1852	0.2243E+12
225	143.227	4.0	1492.191	4.0	74.131	0.1726	0.2095E+12
226	16.176	3.0	1365.694	4.0	74.101	0.4748	0.5767E+12
227	160.534	3.0	1512.017	2.0	73.993	0.1320	0.1608E+12
228	118.470	3.0	1470.781	3.0	73.947	0.5559	0.6781E+12
229	125.821	3.0	1479.749	4.0	73.859	0.1144	0.1398E+12
230	26.651	1.0	1381.308	0.0	73.819	0.1211	0.1483E+12
231	158.896	2.0	1513.924	1.0	73.799	0.1121	0.1373E+12
232	158.896	2.0	1514.910	3.0	73.746	0.1313	0.1610E+12
233	95.162	4.0	1451.613	3.0	73.722	0.0947	0.1162E+12
234	75.230	5.0	1432.574	4.0	73.673	0.1118	0.1374E+12
235	111.609	4.0	1470.781	3.0	73.574	0.3178	0.3915E+12
236	118.470	3.0	1478.404	2.0	73.533	0.1070	0.1320E+12
237	92.487	2.0	1452.658	2.0	73.520	0.1570	0.1937E+12
238	118.470	3.0	1479.749	4.0	73.460	0.1430	0.1768E+12
239	112.332	1.0	1473.659	0.0	73.458	0.0957	0.1183E+12
240	187.597	1.0	1549.229	0.0	73.441	0.2633	0.3257E+12
241	112.332	1.0	1474.560	1.0	73.409	0.1699	0.2103E+12
242	75.565	2.0	1438.338	3.0	73.380	0.2192	0.2715E+12
243	0.003	4.0	1363.818	3.0	73.324	0.2592	0.3216E+12
244	120.450	2.0	1485.158	1.0	73.276	0.4229	0.5253E+12
245	0.003	4.0	1365.694	4.0	73.223	0.9593	0.1193E+13
246	112.332	1.0	1478.404	2.0	73.203	0.1372	0.1708E+12
247	26.651	1.0	1392.865	1.0	73.195	0.1161	0.1445E+12
248	143.227	4.0	1509.576	3.0	73.188	0.0982	0.1222E+12
249	16.176	3.0	1382.522	4.0	73.188	0.4748	0.5912E+12
250	125.821	3.0	1492.191	4.0	73.187	0.0818	0.1018E+12

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
251	95.162	4.0	1462.707	3.0	73.124	0.1297	0.1617E+12
252	111.609	4.0	1479.749	4.0	73.092	0.9630	0.1202E+13
253	187.597	1.0	1557.534	1.0	72.996	0.1380	0.1727E+12
254	215.923	2.0	1586.071	2.0	72.985	0.1035	0.1296E+12
255	129.806	1.0	1500.727	2.0	72.944	0.3085	0.3867E+12
256	290.505	2.0	1662.027	2.0	72.912	0.5069	0.6360E+12
257	225.473	4.0	1597.002	4.0	72.911	0.0902	0.1132E+12
258	106.657	5.0	1479.749	4.0	72.828	0.2474	0.3111E+12
259	64.921	4.0	1438.338	3.0	72.811	0.7657	0.9633E+12
260	88.212	3.0	1462.707	3.0	72.754	0.5405	0.6811E+12
261	75.565	2.0	1451.613	3.0	72.672	0.1827	0.2308E+12
262	198.380	2.0	1574.775	1.0	72.654	0.1702	0.2151E+12
263	123.880	6.0	1501.425	5.0	72.593	0.4686	0.5931E+12
264	143.227	4.0	1520.796	4.0	72.592	1.0194	0.1290E+13
265	106.266	0.0	1485.158	1.0	72.522	0.0810	0.1027E+12
266	123.880	6.0	1504.590	6.0	72.427	2.8892	0.3674E+13
267	92.487	2.0	1474.560	1.0	72.355	0.1236	0.1575E+12
268	0.003	4.0	1382.522	4.0	72.332	0.7782	0.9921E+12
269	20.023	2.0	1402.552	2.0	72.331	0.2547	0.3247E+12
270	215.923	2.0	1599.343	2.0	72.285	0.6401	0.8171E+12
271	129.806	1.0	1513.924	1.0	72.248	0.2917	0.3727E+12
272	95.162	4.0	1479.749	4.0	72.224	0.3180	0.4066E+12
273	196.058	4.0	1580.813	5.0	72.215	0.5233	0.6693E+12
274	212.248	3.0	1597.002	4.0	72.215	0.0877	0.1122E+12
275	160.534	3.0	1545.450	4.0	72.207	0.1034	0.1323E+12
276	189.685	0.0	1574.775	1.0	72.197	0.5994	0.7670E+12
277	106.657	5.0	1492.191	4.0	72.174	0.1975	0.2529E+12
278	187.597	1.0	1573.740	2.0	72.143	0.1676	0.2148E+12
279	125.821	3.0	1512.017	2.0	72.140	0.5790	0.7420E+12
280	16.176	3.0	1402.552	2.0	72.130	0.3466	0.4444E+12
281	64.921	4.0	1451.613	3.0	72.114	0.1671	0.2143E+12
282	215.923	2.0	1602.863	3.0	72.101	0.0933	0.1197E+12
283	75.565	2.0	1462.707	3.0	72.091	0.2991	0.3839E+12
284	198.380	2.0	1586.071	2.0	72.062	0.3784	0.4860E+12
285	111.609	4.0	1501.425	5.0	71.952	0.1755	0.2261E+12
286	88.212	3.0	1478.404	2.0	71.932	0.0807	0.1041E+12
287	120.450	2.0	1512.017	2.0	71.861	0.3523	0.4550E+12
288	92.487	2.0	1485.158	1.0	71.804	0.4958	0.6413E+12
289	371.532	0.0	1764.838	1.0	71.772	0.8055	0.1043E+13
290	118.470	3.0	1512.017	2.0	71.759	0.1996	0.2585E+12
291	120.450	2.0	1514.910	3.0	71.712	0.0879	0.1141E+12
292	106.657	5.0	1501.425	5.0	71.697	2.2388	0.2905E+13
293	125.821	3.0	1520.796	4.0	71.686	0.6306	0.8185E+12
294	225.473	4.0	1621.865	3.0	71.613	0.1134	0.1475E+12
295	118.470	3.0	1514.910	3.0	71.611	0.5446	0.7084E+12
296	95.162	4.0	1492.191	4.0	71.580	0.4602	0.5991E+12
297	64.921	4.0	1462.707	3.0	71.542	0.9089	0.1184E+13
298	106.657	5.0	1504.590	6.0	71.534	0.2570	0.3350E+12
299	75.565	2.0	1474.560	1.0	71.480	0.2055	0.2683E+12
300	112.332	1.0	1512.017	2.0	71.445	0.1664	0.2174E+12

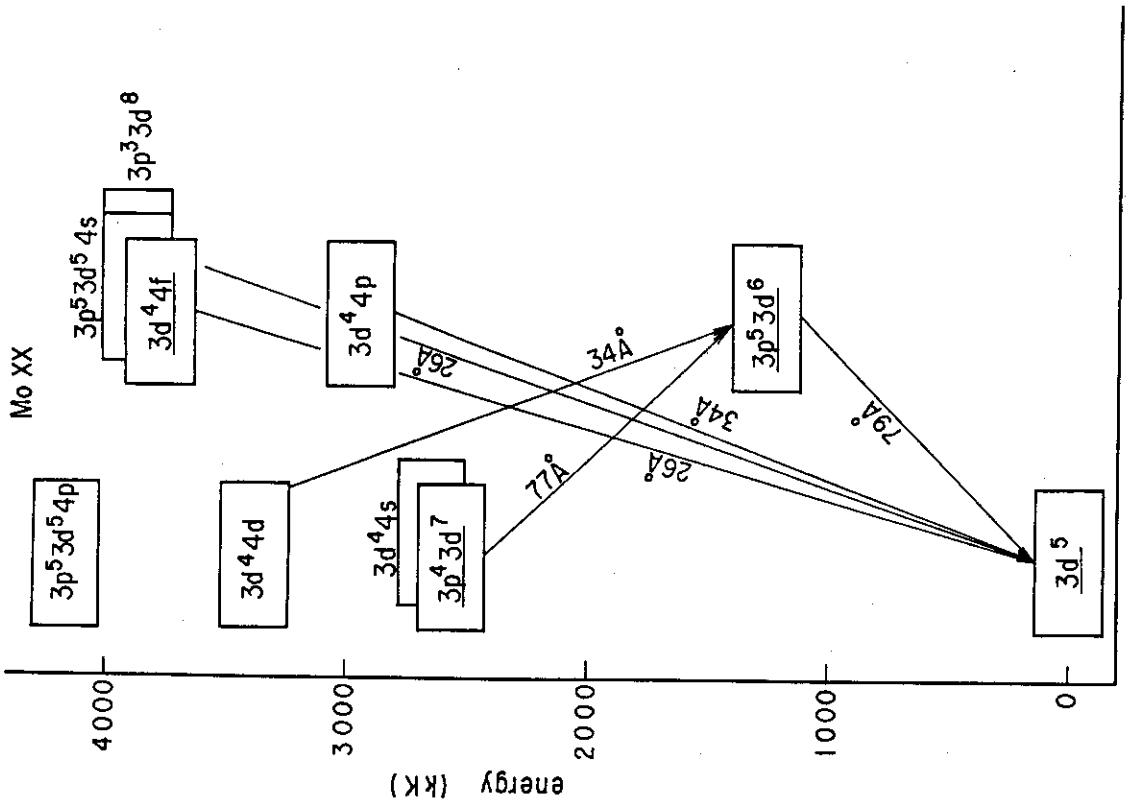
NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
301	198.380	2.0	1599.343	2.0	71.380	0.1073	0.1405E+12
302	196.058	4.0	1597.002	4.0	71.380	0.6993	0.9155E+12
303	156.147	0.0	1557.534	1.0	71.358	0.1130	0.1480E+12
304	143.227	4.0	1545.450	4.0	71.315	0.8641	0.1133E+13
305	111.609	4.0	1514.910	3.0	71.261	0.2198	0.2887E+12
306	88.212	3.0	1492.191	4.0	71.226	0.1774	0.2332E+12
307	75.230	5.0	1479.749	4.0	71.199	0.1728	0.2274E+12
308	64.921	4.0	1470.781	3.0	71.131	0.1999	0.2635E+12
309	95.162	4.0	1501.425	5.0	71.110	0.1182	0.1559E+12
310	290.505	2.0	1698.073	2.0	71.045	1.6295	0.2153E+13
311	225.473	4.0	1634.520	4.0	70.970	2.0567	0.2723E+13
312	111.609	4.0	1520.796	4.0	70.963	0.1386	0.1836E+12
313	75.565	2.0	1485.158	1.0	70.943	0.0866	0.1148E+12
314	212.248	3.0	1621.865	3.0	70.941	0.0992	0.1315E+12
315	187.597	1.0	1599.343	2.0	70.834	0.1209	0.1607E+12
316	290.505	2.0	1704.559	3.0	70.719	0.7226	0.9637E+12
317	106.657	5.0	1520.796	4.0	70.714	0.6830	0.9110E+12
318	95.162	4.0	1509.576	3.0	70.701	0.7843	0.1047E+13
319	158.896	2.0	1573.740	2.0	70.679	0.3405	0.4546E+12
320	225.473	4.0	1640.869	5.0	70.652	0.7844	0.1048E+13
321	158.896	2.0	1574.775	1.0	70.628	0.2405	0.3215E+12
322	125.821	3.0	1542.070	3.0	70.609	0.2833	0.3789E+12
323	75.230	5.0	1492.191	4.0	70.574	0.2761	0.3697E+12
324	198.380	2.0	1616.751	2.0	70.503	0.5708	0.7659E+12
325	129.806	1.0	1549.229	0.0	70.451	0.1859	0.2498E+12
326	92.487	2.0	1512.017	2.0	70.446	0.1601	0.2152E+12
327	95.162	4.0	1514.910	3.0	70.435	0.4031	0.5420E+12
328	88.212	3.0	1509.576	3.0	70.355	0.3784	0.5099E+12
329	92.487	2.0	1513.924	1.0	70.351	0.1065	0.1435E+12
330	212.248	3.0	1634.520	4.0	70.310	0.3630	0.4897E+12
331	118.470	3.0	1542.070	3.0	70.244	0.3689	0.4987E+12
332	88.212	3.0	1512.017	2.0	70.234	0.8612	0.1164E+13
333	160.534	3.0	1586.071	2.0	70.149	0.5780	0.7834E+12
334	196.058	4.0	1621.865	3.0	70.136	0.1818	0.2465E+12
335	212.248	3.0	1638.259	3.0	70.126	0.4172	0.5659E+12
336	75.230	5.0	1501.425	5.0	70.117	0.1266	0.1717E+12
337	64.921	4.0	1492.191	4.0	70.064	0.1014	0.1378E+12
338	73.962	6.0	1501.425	5.0	70.054	0.1857	0.2524E+12
339	129.806	1.0	1557.534	1.0	70.041	0.2822	0.3836E+12
340	187.597	1.0	1616.751	2.0	69.972	0.1780	0.2425E+12
341	73.962	6.0	1504.590	6.0	69.899	0.0803	0.1096E+12
342	111.609	4.0	1545.450	4.0	69.743	0.2595	0.3558E+12
343	198.380	2.0	1632.918	1.0	69.709	1.4677	0.2014E+13
344	112.332	1.0	1549.229	0.0	69.594	0.1550	0.2134E+12
345	106.657	5.0	1545.450	4.0	69.503	0.1798	0.2483E+12
346	160.534	3.0	1599.343	2.0	69.502	0.1720	0.2375E+12
347	118.470	3.0	1559.128	2.0	69.413	0.9827	0.1360E+13
348	196.058	4.0	1638.259	3.0	69.338	1.1394	0.1581E+13
349	160.534	3.0	1602.863	3.0	69.332	0.5806	0.8056E+12
350	158.896	2.0	1602.863	3.0	69.254	0.1340	0.1863E+12

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
351	64.921	4.0	1509.576	3.0	69.221	0.7482	0.1042E+13
352	196.058	4.0	1640.869	5.0	69.213	0.1373	0.1912E+12
353	112.332	1.0	1557.534	1.0	69.195	0.2189	0.3049E+12
354	187.597	1.0	1632.918	1.0	69.189	0.1110	0.1546E+12
355	75.230	5.0	1520.796	4.0	69.177	1.6521	0.2303E+13
356	95.162	4.0	1542.070	3.0	69.113	2.0175	0.2817E+13
357	125.821	3.0	1573.740	2.0	69.065	1.2314	0.1722E+13
358	212.248	3.0	1662.027	2.0	68.976	1.8155	0.2545E+13
359	64.921	4.0	1514.910	3.0	68.966	0.1869	0.2621E+12
360	120.450	2.0	1573.740	2.0	68.809	0.6229	0.8775E+12
361	143.227	4.0	1597.002	4.0	68.786	0.4874	0.6871E+12
362	64.921	4.0	1520.796	4.0	68.687	0.3698	0.5228E+12
363	215.923	2.0	1671.978	1.0	68.679	1.2449	0.1760E+13
364	160.534	3.0	1616.751	2.0	68.671	1.7179	0.2430E+13
365	215.923	2.0	1672.975	3.0	68.632	0.5263	0.7452E+12
366	158.896	2.0	1616.751	2.0	68.594	0.1537	0.2178E+12
367	212.248	3.0	1672.975	3.0	68.459	0.6035	0.8589E+12
368	112.332	1.0	1574.775	1.0	68.379	0.0888	0.1267E+12
369	158.896	2.0	1622.687	1.0	68.316	0.8568	0.1225E+13
370	92.487	2.0	1557.534	1.0	68.257	0.6648	0.9517E+12
371	156.147	0.0	1622.687	1.0	68.188	0.1143	0.1639E+12
372	118.470	3.0	1586.071	2.0	68.138	0.2272	0.3263E+12
373	75.230	5.0	1545.450	4.0	68.017	2.3510	0.3389E+13
374	88.212	3.0	1559.128	2.0	67.985	0.1618	0.2335E+12
375	125.821	3.0	1599.343	2.0	67.865	0.1257	0.1820E+12
376	160.534	3.0	1634.520	4.0	67.843	0.1187	0.1720E+12
377	158.896	2.0	1632.918	1.0	67.842	0.1277	0.1850E+12
378	290.505	2.0	1764.838	1.0	67.827	0.8774	0.1272E+13
379	196.058	4.0	1672.975	3.0	67.709	2.7031	0.3933E+13
380	64.921	4.0	1542.070	3.0	67.698	0.1809	0.2633E+12
381	160.534	3.0	1638.259	3.0	67.672	0.2356	0.3431E+12
382	118.470	3.0	1597.002	4.0	67.635	0.1167	0.1702E+12
383	143.227	4.0	1621.865	3.0	67.630	2.1489	0.3134E+13
384	120.450	2.0	1599.343	2.0	67.618	0.1006	0.1467E+12
385	225.473	4.0	1704.559	3.0	67.609	3.9179	0.5717E+13
386	158.896	2.0	1638.259	3.0	67.597	0.4353	0.6354E+12
387	64.921	4.0	1545.450	4.0	67.543	0.4992	0.7298E+12
388	118.470	3.0	1599.343	2.0	67.528	0.3793	0.5548E+12
389	187.597	1.0	1671.978	1.0	67.368	0.3294	0.4841E+12
390	111.609	4.0	1597.002	4.0	67.322	0.2095	0.3083E+12
391	88.212	3.0	1573.740	2.0	67.316	0.1074	0.1581E+12
392	212.248	3.0	1698.073	2.0	67.303	0.8951	0.1318E+13
393	215.923	2.0	1704.559	3.0	67.176	0.0818	0.1209E+12
394	106.657	5.0	1597.002	4.0	67.099	3.0337	0.4494E+13
395	111.609	4.0	1602.863	3.0	67.058	3.0896	0.4583E+13
396	212.248	3.0	1704.559	3.0	67.010	0.1080	0.1604E+12
397	92.487	2.0	1586.071	2.0	66.953	0.3469	0.5162E+12
398	143.227	4.0	1638.259	3.0	66.888	1.2445	0.1855E+13
399	88.212	3.0	1586.071	2.0	66.762	0.4299	0.6434E+12
400	118.470	3.0	1616.751	2.0	66.743	0.5625	0.8422E+12

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
401	198.380	2.0	1698.073	2.0	66.680	0.1441	0.2162E+12
402	160.534	3.0	1662.027	2.0	66.600	0.1317	0.1981E+12
403	95.162	4.0	1597.002	4.0	66.585	0.5012	0.7541E+12
404	75.230	5.0	1580.813	5.0	66.419	0.9852	0.1490E+13
405	73.962	6.0	1580.813	5.0	66.364	6.8760	0.1041E+14
406	95.162	4.0	1602.863	3.0	66.326	0.1148	0.1740E+12
407	88.212	3.0	1602.863	3.0	66.022	0.2030	0.3106E+12
408	123.880	6.0	1640.869	5.0	65.920	8.1262	0.1247E+14
409	118.470	3.0	1638.259	3.0	65.799	0.1221	0.1881E+12
410	75.230	5.0	1597.002	4.0	65.713	0.1054	0.1628E+12
411	106.657	5.0	1634.520	4.0	65.451	1.0132	0.1578E+13
412	143.227	4.0	1672.975	3.0	65.370	0.1640	0.2560E+12
413	106.657	5.0	1640.869	5.0	65.180	0.0991	0.1555E+12
414	158.896	2.0	1698.073	2.0	64.970	0.1909	0.3016E+12
415	95.162	4.0	1634.520	4.0	64.962	0.2410	0.3808E+12
416	95.162	4.0	1638.259	3.0	64.805	0.1997	0.3171E+12
417	118.470	3.0	1662.027	2.0	64.785	0.1232	0.1958E+12
418	160.534	3.0	1704.559	3.0	64.766	0.2053	0.3264E+12
419	125.821	3.0	1672.975	3.0	64.635	0.0976	0.1559E+12
420	75.230	5.0	1634.520	4.0	64.132	0.1953	0.3167E+12
421	198.380	2.0	1764.838	1.0	63.838	0.1948	0.3188E+12
422	118.470	3.0	1698.073	2.0	63.307	0.1703	0.2834E+12
423	75.565	2.0	1672.975	3.0	62.601	0.1064	0.1811E+12
424	95.162	4.0	1704.559	3.0	62.135	0.1027	0.1774E+12



Mo XX エネルギーレベル
$(3d)^5$, $(3p)^5(3d)^6$



Mo XX グロトリアン・ダイアグラム

Mo XX エネルギー レベル

EVEN $(3d)^5$

ODD $(3p)^5\ (3d)^6$

EVEN PARITY

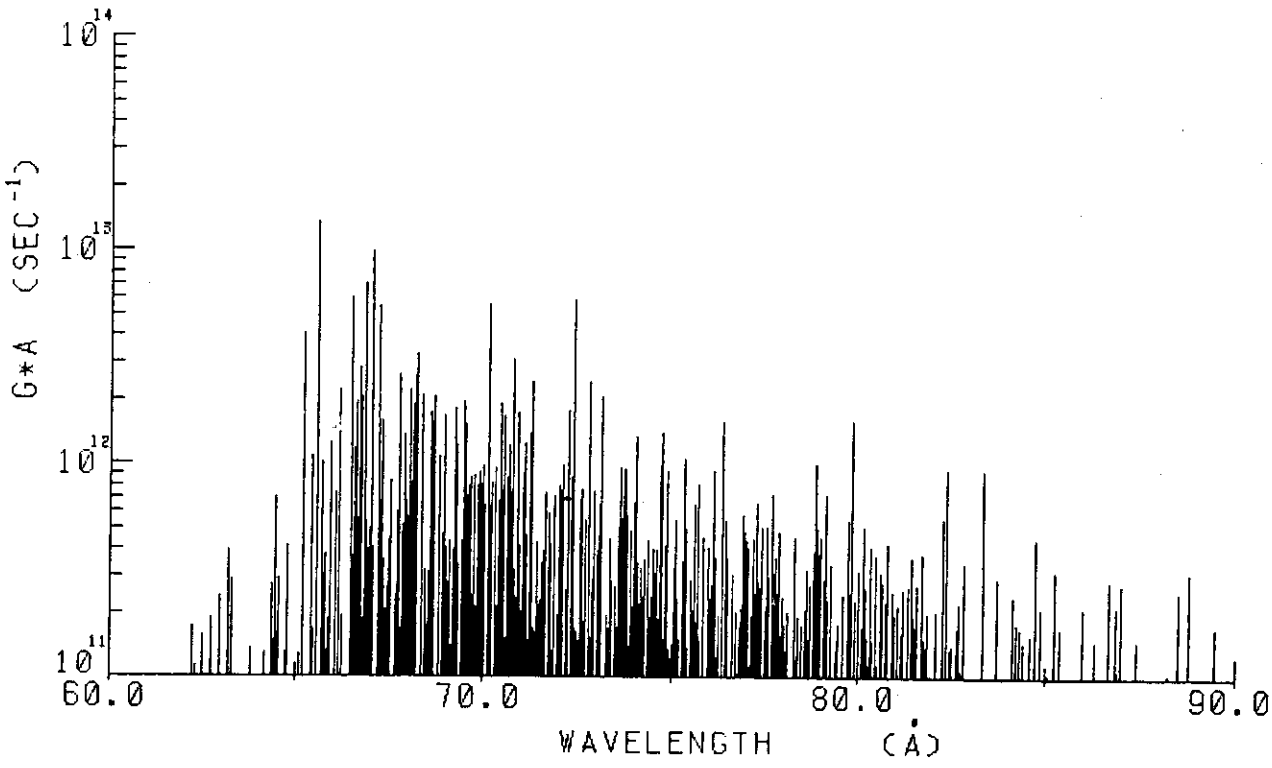
J	NO	ENERGY(KK)		LEADING PERCENTAGES			
0.5	1	114.773	---	1	4P 71.3%	1	4D 25.8%
0.5	2	137.801	---	1	4D 73.9%	1	4P 24.8%
0.5	3	223.540	---	1	2S 92.3%	1	4P 3.8%
0.5	4	334.211	---	1	2P 95.9%	1	2S 3.8%
1.5	1	106.141	---	1	4P 53.9%	1	4D 40.1%
1.5	2	141.762	---	1	4D 52.6%	1	4P 39.6%
1.5	3	160.291	---	1	4F 44.4%	1	2D 35.2%
1.5	4	191.639	---	1	4F 49.6%	1	2D 38.7%
1.5	5	246.920	---	1	2D 93.7%	1	4D 2.9%
1.5	6	324.259	---	1	2P 86.7%	1	2D 9.0%
1.5	7	366.219	---	1	2D 65.9%	1	2D 18.0%
2.5	1	-0.001	---	1	6S 93.5%	1	4P 6.1%
2.5	2	88.177	---	1	4G 46.6%	1	2F 15.4%
2.5	3	103.862	---	1	4G 36.2%	1	4P 30.8%
2.5	4	135.366	---	1	4D 51.0%	1	4P 18.2%
2.5	5	160.318	---	1	2F 24.1%	1	4P 22.1%
2.5	6	176.695	---	1	4F 60.5%	1	2F 16.3%
2.5	7	199.321	---	1	2F 62.2%	1	2D 9.9%
2.5	8	221.443	---	1	2F 35.1%	1	2D 28.4%
2.5	9	257.805	---	1	2D 79.5%	1	2F 13.1%
2.5	10	359.083	---	1	2D 77.0%	1	2D 20.4%
3.5	1	99.184	---	1	4G 82.8%	1	2F 7.9%
3.5	2	125.739	---	1	4D 81.9%	1	4G 9.9%
3.5	3	160.054	---	1	4F 36.4%	1	2F 27.4%
3.5	4	186.998	---	1	2F 29.4%	1	4F 26.6%
3.5	5	195.086	---	1	2G 59.4%	1	2F 31.9%
3.5	6	210.765	---	1	2F 63.3%	1	4F 26.2%
3.5	7	277.960	---	1	2G 91.2%	1	2F 5.5%
4.5	1	103.654	---	1	4G 93.3%	1	4F 3.5%
4.5	2	162.340	---	1	2G 42.4%	1	4F 39.4%
4.5	3	181.290	---	1	2H 56.6%	1	4F 39.7%
4.5	4	209.995	---	1	2G 51.2%	1	2H 28.3%
4.5	5	273.140	---	1	2G 97.3%	1	2G 2.2%
5.5	1	101.247	---	1	4G 89.3%	1	2H 8.8%
5.5	2	142.135	---	1	2I 80.6%	1	2H 13.3%
5.5	3	202.081	---	1	2H 77.9%	1	2I 17.4%
6.5	1	151.782	---	1	2I100.0%		

ODD J	PARITY NO	ENERGY(KK)		LEADING PERCENTAGES	
0.5	1	1206.112	---	1 (5D) 6D 43.8%	1 (5D) 4P 23.6%
0.5	2	1236.406	---	1 (5D) 6F 29.5%	1 (3D) 4D 13.8%
0.5	3	1284.868	---	1 (5D) 6F 39.3%	1 (3P) 2P 16.3%
0.5	4	1304.758	---	1 (5D) 6D 25.6%	1 (3P) 2S 25.3%
0.5	5	1332.009	---	1 (3D) 4D 25.2%	1 (3D) 4P 15.2%
0.5	6	1357.525	---	1 (3F) 4D 25.2%	1 (3D) 4P 15.8%
0.5	7	1372.096	---	1 (3D) 4P 54.4%	1 (3F) 4D 23.4%
0.5	8	1399.813	---	1 (3P) 4P 28.1%	1 (5D) 4P 15.8%
0.5	9	1411.669	---	1 (3P) 4D 14.6%	1 (1D) 2P 14.3%
0.5	10	1446.745	---	1 (3F) 4D 55.8%	1 (3F) 4D 18.1%
0.5	11	1472.971	---	1 (3P) 4D 40.2%	1 (3P) 4P 23.9%
0.5	12	1490.043	---	1 (1D) 2P 36.6%	1 (3D) 2P 10.3%
0.5	13	1511.539	---	1 (3P) 4P 21.0%	1 (1D) 2P 18.2%
0.5	14	1549.891	---	1 (3P) 4D 27.5%	1 (1S) 2P 22.0%
0.5	15	1567.795	---	1 (5D) 4P 19.5%	1 (3P) 2P 17.5%
0.5	16	1577.979	---	1 (5D) 4P 23.3%	1 (3P) 4P 19.3%
0.5	17	1628.698	---	1 (5D) 4D 53.6%	1 (3P) 4D 15.6%
0.5	18	1682.103	---	1 (3P) 2P 23.8%	1 (1S) 2P 22.0%
0.5	19	1709.164	---	1 (3P) 2S 46.0%	1 (3P) 2S 13.6%
0.5	20	1742.435	---	1 (3P) 2P 23.4%	1 (3P) 2P 16.6%
0.5	21	1808.941	---	1 (1S) 2P 54.9%	1 (1S) 2P 19.7%
1.5	1	1202.377	---	1 (5D) 6D 47.3%	1 (5D) 4P 21.1%
1.5	2	1228.453	---	1 (5D) 6F 31.7%	1 (5D) 4F 13.8%
1.5	3	1252.437	---	1 (5D) 6F 15.4%	1 (3F) 4F 14.5%
1.5	4	1268.132	---	1 (5D) 6P 66.3%	1 (5D) 6D 8.1%
1.5	5	1293.210	---	1 (5D) 4F 9.2%	1 (3F) 2D 9.1%
1.5	6	1294.771	---	1 (1S) 2P 18.1%	1 (5D) 6P 13.7%
1.5	7	1320.591	---	1 (3D) 4D 17.5%	1 (3D) 2P 12.6%
1.5	8	1332.121	---	1 (5D) 6D 16.7%	1 (3D) 4P 16.0%
1.5	9	1346.238	---	1 (3F) 4D 18.2%	1 (3F) 4F 12.3%
1.5	10	1352.719	---	1 (3P) 4D 13.2%	1 (1F) 2D 10.0%
1.5	11	1372.472	---	1 (3P) 4P 30.5%	1 (3D) 4P 14.3%
1.5	12	1377.510	---	1 (3D) 4P 18.8%	1 (3P) 2D 8.7%
1.5	13	1402.161	---	1 (3F) 4D 16.5%	1 (3P) 4P 12.6%
1.5	14	1404.519	---	1 (3D) 4F 19.4%	1 (3F) 4D 16.5%
1.5	15	1424.385	---	1 (3P) 4S 19.0%	1 (3P) 4D 12.8%
1.5	16	1429.528	---	1 (3G) 4F 18.6%	1 (3P) 4S 12.5%
1.5	17	1448.704	---	1 (3P) 4S 16.6%	1 (3F) 4F 10.5%
1.5	18	1461.585	---	1 (3P) 4S 12.9%	1 (1D) 2P 11.1%
1.5	19	1485.107	---	1 (3F) 4D 16.4%	1 (3P) 4S 12.0%
1.5	20	1493.709	---	1 (3D) 4D 19.3%	1 (3P) 4D 15.3%
1.5	21	1502.561	---	1 (5D) 4P 13.0%	1 (3P) 2D 11.7%
1.5	22	1515.656	---	1 (1D) 2P 12.1%	1 (1D) 2D 11.8%
1.5	23	1537.843	---	1 (3F) 4F 16.0%	1 (3D) 4F 14.6%
1.5	24	1546.533	---	1 (3F) 4F 22.5%	1 (5D) 4F 18.7%
1.5	25	1563.774	---	1 (3P) 4P 32.7%	1 (5D) 4P 25.8%
1.5	26	1578.274	---	1 (3P) 2D 13.4%	1 (3P) 4S 12.1%
1.5	27	1597.163	---	1 (3P) 2D 37.2%	1 (1F) 2D 18.7%
1.5	28	1617.867	---	1 (1S) 2P 30.3%	1 (1D) 2D 15.4%

ODD PARITY J	NO	ENERGY(KK)		LEADING PERCENTAGES	
1.5	29	1629.176	---	1 (5D) 4D 27.1%	1 (3D) 2P 16.3%
1.5	30	1657.457	---	1 (3D) 2P 22.0%	1 (1D) 2P 17.5%
1.5	31	1676.785	---	1 (1D) 2P 18.1%	1 (3F) 2D 10.0%
1.5	32	1688.623	---	1 (1S) 2P 12.2%	1 (1D) 2D 11.6%
1.5	33	1727.821	---	1 (3F) 2D 27.3%	1 (3D) 2D 24.1%
1.5	34	1780.877	---	1 (3F) 2D 47.9%	1 (3F) 2D 10.4%
1.5	35	1815.564	---	1 (3P) 2P 33.6%	1 (3P) 2P 16.6%
2.5	1	1182.263	---	1 (5D) 6D 27.9%	1 (5D) 4P 26.9%
2.5	2	1206.968	---	1 (5D) 6F 46.7%	1 (5D) 6D 8.9%
2.5	3	1239.844	---	1 (5D) 6D 21.6%	1 (3F) 4F 14.0%
2.5	4	1263.746	---	1 (5D) 6P 31.7%	1 (5D) 6F 14.8%
2.5	5	1273.957	---	1 (5D) 6F 10.7%	1 (3D) 4D 10.3%
2.5	6	1288.709	---	1 (3P) 4D 14.0%	1 (3G) 4G 11.4%
2.5	7	1311.760	---	1 (3P) 4D 14.6%	1 (3G) 4G 11.7%
2.5	8	1319.457	---	1 (3D) 2F 15.9%	1 (1G) 2F 13.8%
2.5	9	1322.698	---	1 (5D) 6P 21.1%	1 (3P) 4P 13.3%
2.5	10	1343.599	---	1 (3G) 4F 22.7%	1 (5D) 6F 10.9%
2.5	11	1352.437	---	1 (3F) 4F 15.8%	1 (3P) 4D 11.1%
2.5	12	1375.336	---	1 (3P) 4P 28.8%	1 (3P) 4P 7.9%
2.5	13	1380.463	---	1 (3H) 4G 15.6%	1 (3F) 4D 10.4%
2.5	14	1382.405	---	1 (1G) 2F 11.2%	1 (3F) 4G 10.9%
2.5	15	1394.030	---	1 (3G) 4G 15.9%	1 (3F) 2F 13.9%
2.5	16	1404.474	---	1 (3H) 4G 27.2%	1 (1G) 2F 6.4%
2.5	17	1408.661	---	1 (3H) 4G 26.7%	1 (3P) 4P 9.0%
2.5	18	1427.534	---	1 (3F) 4D 17.6%	1 (3G) 4G 10.7%
2.5	19	1436.852	---	1 (3F) 4D 16.6%	1 (1G) 2F 14.5%
2.5	20	1446.795	---	1 (3D) 4P 17.2%	1 (1F) 2F 13.2%
2.5	21	1474.685	---	1 (3D) 4F 17.6%	1 (1G) 2F 16.0%
2.5	22	1481.269	---	1 (5D) 4P 20.2%	1 (3P) 4P 17.5%
2.5	23	1483.614	---	1 (3F) 4D 21.0%	1 (3F) 4F 8.9%
2.5	24	1495.199	---	1 (3F) 4F 17.2%	1 (1G) 2F 14.0%
2.5	25	1517.388	---	1 (3D) 4P 13.8%	1 (1D) 2D 9.6%
2.5	26	1530.430	---	1 (3F) 4G 22.4%	1 (1D) 2F 13.9%
2.5	27	1538.377	---	1 (1G) 2F 17.4%	1 (3F) 2F 14.5%
2.5	28	1549.678	---	1 (5D) 4F 12.4%	1 (3F) 4G 10.2%
2.5	29	1568.208	---	1 (5D) 4F 21.7%	1 (3F) 4F 18.9%
2.5	30	1575.865	---	1 (1D) 2D 21.7%	1 (1F) 2D 13.5%
2.5	31	1602.614	---	1 (3P) 2D 27.6%	1 (1D) 2F 12.0%
2.5	32	1609.089	---	1 (3F) 2F 13.9%	1 (3P) 2D 8.6%
2.5	33	1635.523	---	1 (5D) 4D 29.0%	1 (3G) 2F 13.6%
2.5	34	1652.904	---	1 (5D) 4D 13.5%	1 (1D) 2F 12.4%
2.5	35	1680.374	---	1 (3F) 2F 15.6%	1 (1D) 2F 13.5%
2.5	36	1696.062	---	1 (1F) 2D 26.7%	1 (3P) 2D 21.3%
2.5	37	1708.268	---	1 (3D) 2D 24.6%	1 (1D) 2D 15.0%
2.5	38	1740.013	---	1 (3F) 2D 18.9%	1 (1D) 2F 12.7%
2.5	39	1776.853	---	1 (3F) 2D 21.9%	1 (3F) 2F 14.8%
3.5	1	1183.122	---	1 (5D) 6F 50.7%	1 (5D) 6D 30.8%
3.5	2	1211.907	---	1 (5D) 6D 36.9%	1 (5D) 4F 17.8%
3.5	3	1239.254	---	1 (3P) 4D 27.9%	1 (3P) 4D 21.5%

ODD J	PARITY NO	ENERGY(KK)		LEADING PERCENTAGES	
3.5	4	1252.568	---	1 (3P) 4D 17.2%	1 (3D) 4D 16.3%
3.5	5	1264.350	---	1 (3D) 4D 13.4%	1 (3P) 4D 11.6%
3.5	6	1283.111	---	1 (3H) 4H 45.8%	1 (3G) 4H 6.8%
3.5	7	1293.881	---	1 (3D) 2F 12.0%	1 (3F) 4G 11.6%
3.5	8	1302.006	---	1 (3F) 4F 23.5%	1 (3F) 2G 18.0%
3.5	9	1313.472	---	1 (5D) 6P 22.2%	1 (3G) 4F 10.7%
3.5	10	1325.827	---	1 (3G) 4G 13.9%	1 (3G) 4H 13.2%
3.5	11	1335.585	---	1 (5D) 6P 27.4%	1 (3D) 4F 14.3%
3.5	12	1359.706	---	1 (1G) 2G 13.9%	1 (3G) 2G 8.7%
3.5	13	1376.038	---	1 (3H) 4G 16.2%	1 (1G) 2G 11.2%
3.5	14	1398.116	---	1 (3F) 4G 24.8%	1 (3F) 2F 11.8%
3.5	15	1402.976	---	1 (3G) 4H 20.2%	1 (1F) 2F 11.2%
3.5	16	1407.924	---	1 (1F) 2F 16.0%	1 (1D) 2F 12.9%
3.5	17	1422.847	---	1 (3F) 4G 18.1%	1 (1G) 2G 16.4%
3.5	18	1430.541	---	1 (3G) 4G 21.1%	1 (3F) 4F 11.8%
3.5	19	1440.205	---	1 (3F) 4F 14.7%	1 (3H) 4G 13.9%
3.5	20	1448.806	---	1 (3H) 4G 20.1%	1 (3P) 4D 19.4%
3.5	21	1462.228	---	1 (3F) 4D 16.0%	1 (3F) 4G 11.4%
3.5	22	1474.354	---	1 (3F) 4G 21.2%	1 (3F) 4D 11.1%
3.5	23	1485.172	---	1 (1D) 2F 31.3%	1 (1G) 2G 13.0%
3.5	24	1514.979	---	1 (3F) 4G 15.3%	1 (1G) 2G 13.0%
3.5	25	1531.548	---	1 (3F) 4D 31.5%	1 (3F) 4F 10.1%
3.5	26	1563.065	---	1 (1F) 2G 29.1%	1 (3F) 4D 8.7%
3.5	27	1570.660	---	1 (5D) 4F 16.3%	1 (3F) 4D 13.6%
3.5	28	1575.867	---	1 (5D) 4D 13.6%	1 (5D) 4F 11.6%
3.5	29	1581.423	---	1 (1G) 2F 23.8%	1 (3G) 2G 10.1%
3.5	30	1597.500	---	1 (1G) 2F 20.3%	1 (3F) 2G 19.9%
3.5	31	1620.248	---	1 (3G) 2G 14.4%	1 (3F) 2F 12.4%
3.5	32	1647.499	---	1 (5D) 4D 38.7%	1 (3F) 4D 12.3%
3.5	33	1653.275	---	1 (1G) 2F 13.4%	1 (3H) 2G 12.1%
3.5	34	1691.217	---	1 (3H) 2G 18.1%	1 (1G) 2G 18.0%
3.5	35	1698.092	---	1 (3F) 2G 17.5%	1 (3G) 2G 14.0%
3.5	36	1769.058	---	1 (3F) 2F 23.5%	1 (1G) 2F 18.9%
4.5	1	1165.488	---	1 (5D) 6F 68.7%	1 (5D) 6D 28.0%
4.5	2	1184.076	---	1 (5D) 6D 42.6%	1 (5D) 4F 16.3%
4.5	3	1243.208	---	1 (3G) 4H 18.9%	1 (3H) 4H 18.0%
4.5	4	1270.685	---	1 (3H) 4H 20.9%	1 (3F) 4G 17.8%
4.5	5	1275.153	---	1 (3F) 4F 21.7%	1 (5D) 6D 15.4%
4.5	6	1299.077	---	1 (3D) 4F 71.2%	1 (3F) 4F 5.6%
4.5	7	1309.995	---	1 (1F) 2G 22.2%	1 (3H) 2G 20.1%
4.5	8	1324.999	---	1 (3G) 2H 23.6%	1 (3G) 4H 21.9%
4.5	9	1338.788	---	1 (1G) 2H 19.7%	1 (1G) 2G 14.5%
4.5	10	1348.561	---	1 (3G) 4G 21.4%	1 (3H) 4I 17.2%
4.5	11	1365.471	---	1 (3G) 4H 17.4%	1 (3H) 4I 14.7%
4.5	12	1410.616	---	1 (3H) 4I 23.9%	1 (3F) 4F 12.0%
4.5	13	1416.374	---	1 (3F) 4G 34.1%	1 (3F) 4G 20.2%
4.5	14	1441.777	---	1 (3H) 4G 25.3%	1 (1F) 2G 24.3%
4.5	15	1447.894	---	1 (3F) 4F 26.3%	1 (1I) 2H 13.5%
4.5	16	1454.001	---	1 (3G) 4F 15.4%	1 (1G) 2G 8.9%

ODD J	PARITY NO	ENERGY(KK)		LEADING PERCENTAGES	
4.5	17	1462.197	---	1 (3F) 4F 21.1%	1 (3F) 4G 12.1%
4.5	18	1494.929	---	1 (3H) 4G 31.9%	1 (1G) 2H 11.4%
4.5	19	1498.407	---	1 (1G) 2H 23.7%	1 (1G) 2G 15.7%
4.5	20	1548.915	---	1 (3G) 2H 30.9%	1 (1I) 2H 22.3%
4.5	21	1567.929	---	1 (3G) 2G 19.0%	1 (1G) 2H 15.9%
4.5	22	1605.284	---	1 (5D) 4F 39.6%	1 (3G) 4F 14.8%
4.5	23	1629.292	---	1 (1G) 2H 23.2%	1 (3H) 2H 23.0%
4.5	24	1654.100	---	1 (3F) 2G 22.7%	1 (3G) 2G 17.4%
4.5	25	1675.710	---	1 (3F) 2G 39.5%	1 (3G) 2G 11.9%
4.5	26	1693.623	---	1 (3H) 2H 22.5%	1 (3F) 2G 16.2%
5.5	1	1138.707	---	1 (5D) 6F 93.6%	1 (3F) 4G 3.0%
5.5	2	1217.910	---	1 (3G) 4H 23.9%	1 (3F) 4G 16.2%
5.5	3	1257.679	---	1 (3H) 4H 35.1%	1 (3F) 4G 22.6%
5.5	4	1288.914	---	1 (1G) 2H 28.5%	1 (3H) 4I 12.7%
5.5	5	1311.326	---	1 (3G) 4H 31.3%	1 (3G) 2H 18.9%
5.5	6	1339.965	---	1 (1G) 2H 24.8%	1 (3H) 2I 23.9%
5.5	7	1354.231	---	1 (3G) 4G 32.5%	1 (3F) 4G 24.0%
5.5	8	1384.922	---	1 (3F) 4G 45.5%	1 (3F) 4G 24.4%
5.5	9	1396.646	---	1 (1I) 2I 28.5%	1 (3H) 4I 16.1%
5.5	10	1428.140	---	1 (1G) 2H 43.4%	1 (3H) 2I 12.1%
5.5	11	1451.963	---	1 (3H) 4G 26.6%	1 (3H) 2I 14.7%
5.5	12	1501.296	---	1 (3H) 2I 22.9%	1 (3H) 4G 17.0%
5.5	13	1515.247	---	1 (3H) 4G 24.1%	1 (3G) 2H 18.9%
5.5	14	1627.821	---	1 (3H) 2H 32.5%	1 (1I) 2H 30.7%
5.5	15	1676.594	---	1 (3H) 2H 34.4%	1 (3G) 2H 31.0%
6.5	1	1218.984	---	1 (3G) 4H 49.1%	1 (3H) 4H 35.8%
6.5	2	1288.976	---	1 (3H) 4I 56.3%	1 (3H) 2I 21.6%
6.5	3	1301.104	---	1 (3G) 4H 45.7%	1 (3H) 4H 23.6%
6.5	4	1365.680	---	1 (1I) 2I 32.7%	1 (1I) 2K 32.0%
6.5	5	1488.997	---	1 (1I) 2K 48.2%	1 (3H) 2I 28.3%
6.5	6	1533.235	---	1 (3H) 2I 44.8%	1 (1I) 2I 36.3%
7.5	1	1251.698	---	1 (3H) 4I 95.8%	1 (1I) 2K 4.2%
7.5	2	1331.966	---	1 (1I) 2K 95.8%	1 (3H) 4I 4.2%



Mo XX　スペクトル・パターン
$(3d)^5 - (3p)^5\,(3d)^6$

Mo XX 波長，振動子強度

$(3d)^5 - (3p)^5\ (3d)^6$

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
1	202.081	5.5	1288.976	6.5	92.005	0.1500	0.1182E+12
2	101.247	5.5	1218.984	6.5	89.467	0.2084	0.1736E+12
3	162.340	4.5	1288.913	5.5	88.765	0.3677	0.3113E+12
4	210.765	3.5	1338.788	4.5	88.651	0.0952	0.8080E+11
5	195.086	3.5	1324.998	4.5	88.503	0.2988	0.2544E+12
6	209.995	4.5	1339.964	5.5	88.498	0.1314	0.1119E+12
7	160.318	2.5	1293.880	3.5	88.217	0.1214	0.1041E+12
8	195.086	3.5	1338.788	4.5	87.435	0.1130	0.9857E+11
9	99.184	3.5	1243.208	4.5	87.411	0.1706	0.1489E+12
10	162.340	4.5	1311.326	5.5	87.033	0.0902	0.7939E+11
11	176.695	2.5	1325.827	3.5	87.022	0.0968	0.8523E+11
12	160.054	3.5	1309.995	4.5	86.961	0.3107	0.2741E+12
13	88.177	2.5	1239.254	3.5	86.875	0.1233	0.1090E+12
14	186.998	3.5	1338.788	4.5	86.821	0.2438	0.2157E+12
15	103.654	4.5	1257.678	5.5	86.653	0.3189	0.2832E+12
16	359.083	2.5	1514.979	3.5	86.513	0.0913	0.8137E+11
17	181.290	4.5	1339.964	5.5	86.306	0.1674	0.1499E+12
18	160.291	1.5	1319.456	2.5	86.269	0.1458	0.1307E+12
19	202.081	5.5	1365.679	6.5	85.940	0.2333	0.2107E+12
20	99.184	3.5	1270.684	4.5	85.361	0.1841	0.1685E+12
21	125.739	3.5	1299.077	4.5	85.227	0.3453	0.3171E+12
22	101.247	5.5	1275.152	4.5	85.186	0.0886	0.8146E+11
23	99.184	3.5	1275.152	4.5	85.036	0.1076	0.9920E+11
24	88.177	2.5	1264.349	3.5	85.022	0.1139	0.1051E+12
25	186.998	3.5	1365.471	4.5	84.856	0.0817	0.7564E+11
26	160.054	3.5	1338.788	4.5	84.837	0.2287	0.2120E+12
27	151.782	6.5	1331.966	7.5	84.733	0.4868	0.4523E+12
28	246.920	1.5	1427.533	2.5	84.702	0.0829	0.7707E+11
29	221.443	2.5	1402.976	3.5	84.636	0.0896	0.8342E+11
30	106.141	1.5	1288.709	2.5	84.562	0.1694	0.1581E+12
31	103.862	2.5	1288.709	2.5	84.399	0.1571	0.1471E+12
32	103.654	4.5	1288.913	5.5	84.370	0.1444	0.1353E+12
33	162.340	4.5	1348.561	4.5	84.301	0.1815	0.1704E+12
34	101.247	5.5	1288.976	6.5	84.194	0.1914	0.1801E+12
35	273.140	4.5	1462.197	4.5	84.100	0.2561	0.2415E+12
36	246.920	1.5	1436.851	2.5	84.039	0.1022	0.9655E+11
37	162.340	4.5	1354.230	5.5	83.900	0.1013	0.9602E+11
38	210.765	3.5	1402.976	3.5	83.878	0.0870	0.8251E+11
39	88.177	2.5	1283.111	3.5	83.687	0.3088	0.2941E+12
40	160.318	2.5	1359.705	3.5	83.376	0.0984	0.9445E+11
41	101.247	5.5	1301.104	6.5	83.343	0.9729	0.9342E+12
42	135.366	2.5	1335.585	3.5	83.318	0.1345	0.1292E+12
43	176.695	2.5	1380.462	2.5	83.073	0.1007	0.9737E+11
44	209.995	4.5	1416.373	4.5	82.893	0.1015	0.9851E+11
45	103.654	4.5	1311.326	5.5	82.804	0.3533	0.3437E+12
46	135.366	2.5	1343.599	2.5	82.766	0.1071	0.1043E+12
47	202.081	5.5	1410.616	4.5	82.745	0.1123	0.1094E+12
48	103.862	2.5	1313.471	3.5	82.671	0.2273	0.2219E+12
49	125.739	3.5	1335.585	3.5	82.655	0.1733	0.1692E+12
50	-0.001	2.5	1211.906	3.5	82.515	0.1427	0.1398E+12

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
51	273.140	4.5	1485.171	3.5	82.506	0.1091	0.1069E+12
52	210.765	3.5	1422.847	3.5	82.503	0.1427	0.1398E+12
53	142.135	5.5	1354.230	5.5	82.502	0.1205	0.1181E+12
54	191.639	1.5	1404.474	2.5	82.452	0.1347	0.1322E+12
55	209.995	4.5	1422.847	3.5	82.450	0.1373	0.1347E+12
56	151.782	6.5	1365.679	6.5	82.379	0.9805	0.9637E+12
57	99.184	3.5	1313.471	3.5	82.353	0.1255	0.1235E+12
58	160.291	1.5	1375.336	2.5	82.301	0.0867	0.8538E+11
59	181.290	4.5	1396.646	5.5	82.280	0.5730	0.5645E+12
60	195.086	3.5	1410.616	4.5	82.269	0.1681	0.1657E+12
61	191.639	1.5	1408.661	2.5	82.168	0.0934	0.9224E+11
62	135.366	2.5	1352.436	2.5	82.165	0.0826	0.8162E+11
63	209.995	4.5	1428.140	5.5	82.092	0.2070	0.2048E+12
64	277.960	3.5	1498.407	4.5	81.937	0.1032	0.1025E+12
65	273.140	4.5	1494.929	4.5	81.847	0.2018	0.2009E+12
66	160.291	1.5	1382.404	2.5	81.825	0.0959	0.9549E+11
67	162.340	4.5	1384.921	5.5	81.794	0.1386	0.1382E+12
68	125.739	3.5	1348.561	4.5	81.778	0.1510	0.1506E+12
69	142.135	5.5	1365.471	4.5	81.744	0.1377	0.1374E+12
70	199.321	2.5	1422.847	3.5	81.731	0.1341	0.1339E+12
71	142.135	5.5	1365.679	6.5	81.730	0.3841	0.3835E+12
72	88.177	2.5	1311.760	2.5	81.727	0.1079	0.1078E+12
73	99.184	3.5	1324.998	4.5	81.579	0.0971	0.9734E+11
74	202.081	5.5	1428.140	5.5	81.562	0.2709	0.2716E+12
75	99.184	3.5	1325.827	3.5	81.523	0.1719	0.1725E+12
76	257.805	2.5	1485.171	3.5	81.475	0.1925	0.1934E+12
77	246.920	1.5	1474.685	2.5	81.449	0.0901	0.9059E+11
78	273.140	4.5	1501.296	5.5	81.423	0.3642	0.3664E+12
79	199.321	2.5	1427.533	2.5	81.419	0.2322	0.2336E+12
80	181.290	4.5	1410.616	4.5	81.345	0.2423	0.2442E+12
81	210.765	3.5	1440.204	3.5	81.338	0.2672	0.2694E+12
82	88.177	2.5	1319.456	2.5	81.216	0.1022	0.1034E+12
83	114.773	0.5	1346.237	1.5	81.204	0.2558	0.2587E+12
84	103.862	2.5	1335.585	3.5	81.187	0.0928	0.9388E+11
85	209.995	4.5	1441.776	4.5	81.183	0.1571	0.1590E+12
86	103.654	4.5	1335.585	3.5	81.173	0.0827	0.8374E+11
87	151.782	6.5	1384.921	5.5	81.094	0.0899	0.9116E+11
88	141.762	1.5	1375.336	2.5	81.065	0.1342	0.1362E+12
89	160.291	1.5	1394.030	2.5	81.054	0.2154	0.2187E+12
90	137.801	0.5	1372.471	1.5	80.993	0.1118	0.1137E+12
91	181.290	4.5	1416.373	4.5	80.966	0.1785	0.1816E+12
92	103.654	4.5	1338.788	4.5	80.963	0.1936	0.1970E+12
93	141.762	1.5	1377.509	1.5	80.923	0.2467	0.2513E+12
94	186.998	3.5	1422.847	3.5	80.916	0.1142	0.1163E+12
95	106.141	1.5	1343.599	2.5	80.811	0.3539	0.3615E+12
96	88.177	2.5	1325.827	3.5	80.798	0.1117	0.1141E+12
97	114.773	0.5	1352.718	1.5	80.779	0.1024	0.1047E+12
98	160.054	3.5	1398.115	3.5	80.772	0.4116	0.4208E+12
99	359.083	2.5	1597.499	3.5	80.748	0.1286	0.1315E+12
100	101.247	5.5	1339.964	5.5	80.729	0.2232	0.2284E+12

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
101	125.739	3.5	1365.471	4.5	80.663	0.2184	0.2238E+12
102	-0.001	2.5	1239.844	2.5	80.655	0.2688	0.2756E+12
103	106.141	1.5	1346.237	1.5	80.639	0.1824	0.1871E+12
104	162.340	4.5	1402.976	3.5	80.604	0.0880	0.9035E+11
105	135.366	2.5	1376.037	3.5	80.602	0.3008	0.3088E+12
106	160.318	2.5	1402.161	1.5	80.525	0.0903	0.9292E+11
107	209.995	4.5	1451.962	5.5	80.517	0.1125	0.1158E+12
108	273.140	4.5	1515.246	5.5	80.508	0.1028	0.1057E+12
109	114.773	0.5	1357.525	0.5	80.467	0.3650	0.3760E+12
110	366.219	1.5	1609.088	2.5	80.459	0.2082	0.2145E+12
111	160.054	3.5	1402.976	3.5	80.456	0.1681	0.1732E+12
112	246.920	1.5	1490.042	0.5	80.443	0.0824	0.8491E+11
113	209.995	4.5	1454.000	4.5	80.386	0.0982	0.1014E+12
114	160.318	2.5	1404.474	2.5	80.376	0.1441	0.1488E+12
115	160.054	3.5	1404.474	2.5	80.359	0.0911	0.9405E+11
116	151.782	6.5	1396.646	5.5	80.330	0.2044	0.2113E+12
117	103.654	4.5	1348.561	4.5	80.327	0.3970	0.4104E+12
118	191.639	1.5	1436.851	2.5	80.308	0.1715	0.1774E+12
119	202.081	5.5	1447.894	4.5	80.269	0.1112	0.1151E+12
120	106.141	1.5	1352.436	2.5	80.238	0.1041	0.1079E+12
121	106.141	1.5	1352.718	1.5	80.220	0.1490	0.1545E+12
122	135.366	2.5	1382.404	2.5	80.190	0.2514	0.2608E+12
123	160.054	3.5	1407.924	3.5	80.137	0.4898	0.5087E+12
124	162.340	4.5	1410.616	4.5	80.111	0.1365	0.1418E+12
125	246.920	1.5	1495.199	2.5	80.110	0.1647	0.1712E+12
126	160.318	2.5	1408.661	2.5	80.106	0.1106	0.1150E+12
127	181.290	4.5	1430.540	3.5	80.048	0.0890	0.9268E+11
128	125.739	3.5	1375.336	2.5	80.026	0.3054	0.3181E+12
129	186.998	3.5	1436.851	2.5	80.009	0.2095	0.2182E+12
130	210.765	3.5	1462.197	4.5	79.909	0.1983	0.2072E+12
131	324.259	1.5	1575.865	2.5	79.897	0.2209	0.2308E+12
132	-0.001	2.5	1252.567	3.5	79.836	0.2894	0.3028E+12
133	195.086	3.5	1447.894	4.5	79.821	0.2668	0.2793E+12
134	101.247	5.5	1354.230	5.5	79.810	1.5382	0.1611E+13
135	186.998	3.5	1440.204	3.5	79.795	0.2362	0.2474E+12
136	162.340	4.5	1416.373	4.5	79.743	0.1934	0.2028E+12
137	142.135	5.5	1396.646	5.5	79.712	0.5193	0.5451E+12
138	160.054	3.5	1416.373	4.5	79.598	0.2333	0.2456E+12
139	273.140	4.5	1531.548	3.5	79.466	0.1194	0.1261E+12
140	195.086	3.5	1454.000	4.5	79.434	0.1693	0.1790E+12
141	257.805	2.5	1517.388	2.5	79.391	0.1267	0.1341E+12
142	176.695	2.5	1436.851	2.5	79.355	0.0847	0.8970E+11
143	103.654	4.5	1365.471	4.5	79.251	0.3214	0.3413E+12
144	160.318	2.5	1422.847	3.5	79.206	0.0851	0.9045E+11
145	141.762	1.5	1404.474	2.5	79.195	0.2179	0.2318E+12
146	160.054	3.5	1422.847	3.5	79.190	0.1943	0.2067E+12
147	334.211	0.5	1597.163	1.5	79.180	0.0952	0.1013E+12
148	221.443	2.5	1485.171	3.5	79.131	0.1414	0.1506E+12
149	-0.001	2.5	1263.745	2.5	79.130	0.6861	0.7309E+12
150	-0.001	2.5	1264.349	3.5	79.092	0.2696	0.2874E+12

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
151	101.247	5.5	1365.679	6.5	79.087	0.2490	0.2656E+12
152	246.920	1.5	1511.539	0.5	79.075	0.1006	0.1073E+12
153	106.141	1.5	1372.096	0.5	78.992	0.4244	0.4536E+12
154	99.184	3.5	1365.471	4.5	78.971	0.4186	0.4477E+12
155	223.540	0.5	1490.042	0.5	78.958	0.1459	0.1561E+12
156	181.290	4.5	1447.894	4.5	78.951	0.3582	0.3833E+12
157	137.801	0.5	1404.518	1.5	78.944	0.0860	0.9202E+11
158	186.998	3.5	1454.000	4.5	78.926	0.2475	0.2650E+12
159	135.366	2.5	1402.976	3.5	78.889	0.4656	0.4990E+12
160	-0.001	2.5	1268.131	1.5	78.856	0.9453	0.1014E+13
161	125.739	3.5	1394.030	2.5	78.846	0.1310	0.1406E+12
162	103.862	2.5	1372.471	1.5	78.826	0.3579	0.3842E+12
163	135.366	2.5	1404.474	2.5	78.796	0.2527	0.2715E+12
164	181.290	4.5	1451.962	5.5	78.699	0.2554	0.2750E+12
165	277.960	3.5	1548.915	4.5	78.681	0.1406	0.1515E+12
166	103.862	2.5	1375.336	2.5	78.649	0.1054	0.1137E+12
167	88.177	2.5	1359.705	3.5	78.646	0.2960	0.3192E+12
168	176.695	2.5	1448.805	3.5	78.610	0.1949	0.2103E+12
169	103.654	4.5	1376.037	3.5	78.593	0.1523	0.1645E+12
170	125.739	3.5	1398.115	3.5	78.593	0.1917	0.2070E+12
171	106.141	1.5	1380.462	2.5	78.473	0.1631	0.1766E+12
172	210.765	3.5	1485.171	3.5	78.468	0.0887	0.9609E+11
173	199.321	2.5	1474.685	2.5	78.409	0.1782	0.1934E+12
174	99.184	3.5	1375.336	2.5	78.361	0.1108	0.1203E+12
175	99.184	3.5	1376.037	3.5	78.318	0.4241	0.4612E+12
176	162.340	4.5	1441.776	4.5	78.159	0.0888	0.9695E+11
177	160.318	2.5	1440.204	3.5	78.132	0.1857	0.2029E+12
178	103.654	4.5	1384.921	5.5	78.048	0.1212	0.1327E+12
179	99.184	3.5	1380.462	2.5	78.047	0.0866	0.9479E+11
180	160.054	3.5	1441.776	4.5	78.020	0.1610	0.1764E+12
181	125.739	3.5	1407.924	3.5	77.992	0.2197	0.2409E+12
182	191.639	1.5	1474.685	2.5	77.940	0.1441	0.1582E+12
183	101.247	5.5	1384.921	5.5	77.901	0.0856	0.9410E+11
184	210.765	3.5	1494.929	4.5	77.872	0.4393	0.4832E+12
185	88.177	2.5	1372.471	1.5	77.864	0.3215	0.3536E+12
186	199.321	2.5	1483.613	2.5	77.864	0.2202	0.2422E+12
187	125.739	3.5	1410.616	4.5	77.829	0.1902	0.2094E+12
188	209.995	4.5	1494.929	4.5	77.825	0.2279	0.2510E+12
189	277.960	3.5	1563.065	3.5	77.815	0.3326	0.3664E+12
190	162.340	4.5	1447.894	4.5	77.788	0.2495	0.2750E+12
191	142.135	5.5	1428.140	5.5	77.760	0.2809	0.3099E+12
192	160.318	2.5	1446.794	2.5	77.732	0.0834	0.9212E+11
193	162.340	4.5	1448.805	3.5	77.732	0.0841	0.9278E+11
194	160.291	1.5	1446.794	2.5	77.730	0.1978	0.2184E+12
195	137.801	0.5	1424.384	1.5	77.725	0.1738	0.1919E+12
196	202.081	5.5	1488.996	6.5	77.705	0.6533	0.7217E+12
197	88.177	2.5	1375.336	2.5	77.691	0.3741	0.4134E+12
198	186.998	3.5	1474.354	3.5	77.679	0.1592	0.1760E+12
199	160.291	1.5	1448.703	1.5	77.615	0.2689	0.2977E+12
200	160.318	2.5	1448.805	3.5	77.610	0.1621	0.1795E+12

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
201	-0.001	2.5	1288.709	2.5	77.597	0.0935	0.1036E+12
202	162.340	4.5	1451.962	5.5	77.542	0.4564	0.5063E+12
203	277.960	3.5	1567.928	4.5	77.521	0.1120	0.1243E+12
204	103.862	2.5	1394.030	2.5	77.509	0.1880	0.2088E+12
205	209.995	4.5	1501.296	5.5	77.441	0.4326	0.4811E+12
206	162.340	4.5	1454.000	4.5	77.420	0.4607	0.5126E+12
207	137.801	0.5	1429.528	1.5	77.416	0.2388	0.2658E+12
208	223.540	0.5	1515.655	1.5	77.393	0.1612	0.1795E+12
209	88.177	2.5	1380.462	2.5	77.382	0.2406	0.2680E+12
210	202.081	5.5	1494.929	4.5	77.349	0.0834	0.9297E+11
211	103.654	4.5	1396.646	5.5	77.340	0.2518	0.2808E+12
212	221.443	2.5	1514.979	3.5	77.307	0.1475	0.1646E+12
213	324.259	1.5	1617.866	1.5	77.303	0.1788	0.1995E+12
214	160.054	3.5	1454.000	4.5	77.283	0.5919	0.6610E+12
215	135.366	2.5	1429.528	1.5	77.270	0.0864	0.9652E+11
216	359.083	2.5	1653.274	3.5	77.268	0.1671	0.1866E+12
217	88.177	2.5	1382.404	2.5	77.266	0.1890	0.2111E+12
218	-0.001	2.5	1294.771	1.5	77.234	0.2225	0.2488E+12
219	273.140	4.5	1567.928	4.5	77.233	0.1804	0.2017E+12
220	141.762	1.5	1436.851	2.5	77.215	0.3985	0.4458E+12
221	135.366	2.5	1430.540	3.5	77.210	0.0898	0.1005E+12
222	221.443	2.5	1517.388	2.5	77.164	0.1761	0.1972E+12
223	114.773	0.5	1411.669	0.5	77.107	0.0998	0.1120E+12
224	176.695	2.5	1474.354	3.5	77.062	0.3637	0.4085E+12
225	99.184	3.5	1398.115	3.5	76.986	0.3927	0.4419E+12
226	202.081	5.5	1501.296	5.5	76.970	0.4272	0.4810E+12
227	103.654	4.5	1402.976	3.5	76.963	0.0897	0.1010E+12
228	162.340	4.5	1462.197	4.5	76.932	0.5168	0.5824E+12
229	195.086	3.5	1494.929	4.5	76.932	0.2206	0.2486E+12
230	162.340	4.5	1462.228	3.5	76.930	0.1463	0.1648E+12
231	151.782	6.5	1451.962	5.5	76.912	0.1890	0.2131E+12
232	103.862	2.5	1404.474	2.5	76.887	0.1881	0.2122E+12
233	160.291	1.5	1461.584	1.5	76.847	0.1313	0.1483E+12
234	160.318	2.5	1462.228	3.5	76.810	0.1534	0.1734E+12
235	160.054	3.5	1462.228	3.5	76.795	0.0920	0.1040E+12
236	195.086	3.5	1498.407	4.5	76.727	0.1261	0.1429E+12
237	277.960	3.5	1581.423	3.5	76.719	0.1785	0.2023E+12
238	125.739	3.5	1430.540	3.5	76.640	0.1157	0.1314E+12
239	103.862	2.5	1408.661	2.5	76.640	0.2698	0.3064E+12
240	141.762	1.5	1448.703	1.5	76.515	0.1212	0.1381E+12
241	103.654	4.5	1410.616	4.5	76.513	0.3217	0.3665E+12
242	186.998	3.5	1494.929	4.5	76.457	0.4804	0.5482E+12
243	137.801	0.5	1446.745	0.5	76.398	0.0871	0.9948E+11
244	99.184	3.5	1408.661	2.5	76.366	0.1142	0.1306E+12
245	142.135	5.5	1451.962	5.5	76.346	1.4102	0.1614E+13
246	186.998	3.5	1498.407	4.5	76.254	0.1720	0.1974E+12
247	-0.001	2.5	1311.760	2.5	76.233	0.1075	0.1234E+12
248	103.654	4.5	1416.373	4.5	76.178	0.3199	0.3676E+12
249	135.366	2.5	1448.703	1.5	76.142	0.2306	0.2653E+12
250	-0.001	2.5	1313.471	3.5	76.134	0.8132	0.9357E+12

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
251	88.177	2.5	1402.161	1.5	76.104	0.1436	0.1653E+12
252	366.219	1.5	1680.373	2.5	76.095	0.2382	0.2743E+12
253	160.318	2.5	1474.685	2.5	76.082	0.2221	0.2560E+12
254	160.054	3.5	1474.685	2.5	76.067	0.1454	0.1676E+12
255	101.247	5.5	1416.373	4.5	76.038	0.2051	0.2366E+12
256	125.739	3.5	1441.776	4.5	75.986	0.3539	0.4089E+12
257	88.177	2.5	1404.518	1.5	75.968	0.0825	0.9535E+11
258	106.141	1.5	1424.384	1.5	75.859	0.0935	0.1084E+12
259	176.695	2.5	1495.199	2.5	75.844	0.3915	0.4540E+12
260	181.290	4.5	1501.296	5.5	75.757	0.1287	0.1496E+12
261	257.805	2.5	1578.274	1.5	75.731	0.0963	0.1120E+12
262	88.177	2.5	1408.661	2.5	75.730	0.6928	0.8057E+12
263	210.765	3.5	1531.548	3.5	75.713	0.0874	0.1016E+12
264	160.318	2.5	1481.269	2.5	75.703	0.1537	0.1789E+12
265	160.291	1.5	1481.269	2.5	75.701	0.0818	0.9515E+11
266	125.739	3.5	1446.794	2.5	75.697	0.1892	0.2202E+12
267	106.141	1.5	1427.533	2.5	75.678	0.1496	0.1742E+12
268	209.995	4.5	1531.548	3.5	75.669	0.1568	0.1826E+12
269	-0.001	2.5	1322.697	2.5	75.603	0.5510	0.6429E+12
270	160.318	2.5	1483.613	2.5	75.569	0.1770	0.2067E+12
271	103.862	2.5	1427.533	2.5	75.547	0.2450	0.2863E+12
272	273.140	4.5	1597.499	3.5	75.508	0.1188	0.1390E+12
273	103.862	2.5	1429.528	1.5	75.434	0.1181	0.1384E+12
274	176.695	2.5	1502.560	1.5	75.422	0.0840	0.9853E+11
275	135.366	2.5	1461.584	1.5	75.402	0.0966	0.1133E+12
276	103.862	2.5	1430.540	3.5	75.376	0.4287	0.5032E+12
277	135.366	2.5	1462.228	3.5	75.366	0.3777	0.4435E+12
278	101.247	5.5	1428.140	5.5	75.364	0.9159	0.1076E+13
279	103.654	4.5	1430.540	3.5	75.364	0.0845	0.9920E+11
280	277.960	3.5	1605.284	4.5	75.340	0.0854	0.1003E+12
281	125.739	3.5	1454.000	4.5	75.286	0.2976	0.3502E+12
282	359.083	2.5	1688.622	1.5	75.214	0.1280	0.1509E+12
283	366.219	1.5	1696.061	2.5	75.197	0.0970	0.1144E+12
284	186.998	3.5	1517.388	2.5	75.166	0.1989	0.2348E+12
285	202.081	5.5	1533.234	6.5	75.123	0.0814	0.9625E+11
286	246.920	1.5	1578.274	1.5	75.112	0.1795	0.2123E+12
287	99.184	3.5	1430.540	3.5	75.111	0.4614	0.5454E+12
288	-0.001	2.5	1332.120	1.5	75.068	0.0858	0.1016E+12
289	199.321	2.5	1531.548	3.5	75.062	0.2753	0.3258E+12
290	141.762	1.5	1474.685	2.5	75.023	0.1202	0.1425E+12
291	181.290	4.5	1514.979	3.5	74.980	0.0968	0.1149E+12
292	181.290	4.5	1515.246	5.5	74.965	0.1047	0.1243E+12
293	160.291	1.5	1495.199	2.5	74.912	0.1141	0.1356E+12
294	-0.001	2.5	1335.585	3.5	74.873	0.7878	0.9373E+12
295	125.739	3.5	1462.228	3.5	74.823	0.3512	0.4184E+12
296	103.654	4.5	1440.204	3.5	74.819	0.2523	0.3006E+12
297	151.782	6.5	1488.996	6.5	74.782	0.1268	0.1513E+12
298	99.184	3.5	1436.851	2.5	74.757	0.0892	0.1065E+12
299	103.654	4.5	1441.776	4.5	74.732	1.1856	0.1416E+13
300	176.695	2.5	1514.979	3.5	74.723	0.1511	0.1805E+12

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
301	191.639	1.5	1530.430	2.5	74.694	0.1861	0.2224E+12
302	210.765	3.5	1549.677	2.5	74.688	0.1839	0.2199E+12
303	162.340	4.5	1501.296	5.5	74.685	0.0919	0.1099E+12
304	135.366	2.5	1474.354	3.5	74.683	0.1575	0.1884E+12
305	199.321	2.5	1538.376	2.5	74.680	0.8343	0.9977E+12
306	135.366	2.5	1474.685	2.5	74.665	0.1577	0.1887E+12
307	88.177	2.5	1427.533	2.5	74.663	0.0827	0.9890E+11
308	257.805	2.5	1597.499	3.5	74.644	0.0890	0.1066E+12
309	101.247	5.5	1441.776	4.5	74.597	0.3361	0.4029E+12
310	99.184	3.5	1440.204	3.5	74.570	0.2601	0.3120E+12
311	221.443	2.5	1563.065	3.5	74.537	0.0967	0.1160E+12
312	141.762	1.5	1483.613	2.5	74.524	0.3202	0.3845E+12
313	366.219	1.5	1708.268	2.5	74.513	0.3366	0.4043E+12
314	160.318	2.5	1502.560	1.5	74.502	0.2150	0.2584E+12
315	160.291	1.5	1502.560	1.5	74.501	0.3320	0.3990E+12
316	277.960	3.5	1620.248	3.5	74.500	0.1175	0.1412E+12
317	106.141	1.5	1448.703	1.5	74.484	0.0946	0.1138E+12
318	99.184	3.5	1441.776	4.5	74.483	0.2001	0.2406E+12
319	103.862	2.5	1446.794	2.5	74.464	0.0819	0.9847E+11
320	-0.001	2.5	1343.599	2.5	74.427	0.1599	0.1926E+12
321	223.540	0.5	1567.795	0.5	74.391	0.0922	0.1111E+12
322	257.805	2.5	1602.613	2.5	74.360	0.3659	0.4413E+12
323	191.639	1.5	1537.843	1.5	74.283	0.2984	0.3607E+12
324	101.247	5.5	1447.894	4.5	74.259	0.1290	0.1560E+12
325	221.443	2.5	1568.208	2.5	74.252	0.1976	0.2391E+12
326	135.366	2.5	1483.613	2.5	74.170	0.2709	0.3285E+12
327	125.739	3.5	1474.354	3.5	74.150	0.1846	0.2239E+12
328	359.083	2.5	1708.268	2.5	74.119	0.1563	0.1898E+12
329	99.184	3.5	1448.805	3.5	74.095	0.2865	0.3480E+12
330	246.920	1.5	1597.163	1.5	74.061	0.2480	0.3016E+12
331	199.321	2.5	1549.677	2.5	74.055	0.3051	0.3711E+12
332	101.247	5.5	1451.962	5.5	74.035	1.1151	0.1357E+13
333	257.805	2.5	1609.088	2.5	74.004	0.1094	0.1333E+12
334	277.960	3.5	1629.291	4.5	74.001	0.5437	0.6622E+12
335	141.762	1.5	1493.709	1.5	73.967	0.1777	0.2166E+12
336	101.247	5.5	1454.000	4.5	73.923	0.3363	0.4105E+12
337	162.340	4.5	1515.246	5.5	73.915	0.4037	0.4928E+12
338	176.695	2.5	1530.430	2.5	73.870	0.1154	0.1411E+12
339	334.211	0.5	1688.622	1.5	73.833	0.0919	0.1124E+12
340	221.443	2.5	1575.866	3.5	73.832	0.0885	0.1083E+12
341	160.318	2.5	1514.979	3.5	73.819	0.1688	0.2066E+12
342	273.140	4.5	1627.820	5.5	73.818	0.1284	0.1571E+12
343	176.695	2.5	1531.548	3.5	73.809	0.2091	0.2560E+12
344	191.639	1.5	1546.532	1.5	73.807	0.4728	0.5789E+12
345	160.291	1.5	1515.655	1.5	73.781	0.0981	0.1202E+12
346	106.141	1.5	1461.584	1.5	73.777	0.0861	0.1055E+12
347	125.739	3.5	1481.269	2.5	73.772	0.7847	0.9617E+12
348	137.801	0.5	1493.709	1.5	73.751	0.1579	0.1936E+12
349	324.259	1.5	1680.373	2.5	73.740	0.0918	0.1126E+12
350	273.140	4.5	1629.291	4.5	73.738	0.7751	0.9508E+12

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
351	160.318	2.5	1517.388	2.5	73.688	0.4516	0.5547E+12
352	210.765	3.5	1567.928	4.5	73.683	0.0982	0.1207E+12
353	103.862	2.5	1461.584	1.5	73.653	0.1941	0.2386E+12
354	209.995	4.5	1567.928	4.5	73.641	0.7865	0.9673E+12
355	135.366	2.5	1493.709	1.5	73.619	0.1062	0.1307E+12
356	103.862	2.5	1462.228	3.5	73.618	0.1219	0.1501E+12
357	103.654	4.5	1462.228	3.5	73.607	0.3905	0.4807E+12
358	88.177	2.5	1446.794	2.5	73.604	0.1038	0.1278E+12
359	142.135	5.5	1501.296	5.5	73.575	0.4145	0.5107E+12
360	125.739	3.5	1485.171	3.5	73.560	0.0920	0.1134E+12
361	-0.001	2.5	1359.705	3.5	73.545	0.1387	0.1710E+12
362	210.765	3.5	1570.659	3.5	73.535	0.1388	0.1712E+12
363	88.177	2.5	1448.703	1.5	73.501	0.2177	0.2688E+12
364	257.805	2.5	1620.248	3.5	73.398	0.2286	0.2830E+12
365	151.782	6.5	1515.246	5.5	73.343	0.3638	0.4511E+12
366	324.259	1.5	1688.622	1.5	73.294	0.1351	0.1677E+12
367	199.321	2.5	1563.774	1.5	73.289	0.1215	0.1508E+12
368	210.765	3.5	1575.866	3.5	73.255	0.1570	0.1951E+12
369	181.290	4.5	1548.915	4.5	73.119	1.6680	0.2081E+13
370	195.086	3.5	1563.065	3.5	73.101	0.5171	0.6454E+12
371	199.321	2.5	1568.208	2.5	73.052	0.3136	0.3919E+12
372	210.765	3.5	1581.423	3.5	72.958	0.6018	0.7541E+12
373	257.805	2.5	1629.175	1.5	72.920	0.2297	0.2881E+12
374	209.995	4.5	1581.423	3.5	72.917	0.1351	0.1694E+12
375	324.259	1.5	1696.061	2.5	72.897	0.1117	0.1402E+12
376	125.739	3.5	1498.407	4.5	72.851	0.1228	0.1544E+12
377	195.086	3.5	1567.928	4.5	72.842	0.1005	0.1264E+12
378	142.135	5.5	1515.246	5.5	72.827	1.9564	0.2460E+13
379	366.219	1.5	1740.012	2.5	72.791	0.1286	0.1619E+12
380	334.211	0.5	1709.164	0.5	72.730	0.4372	0.5513E+12
381	106.141	1.5	1481.269	2.5	72.720	0.1886	0.2379E+12
382	99.184	3.5	1474.354	3.5	72.718	0.1275	0.1608E+12
383	277.960	3.5	1653.274	3.5	72.711	0.1495	0.1887E+12
384	99.184	3.5	1474.685	2.5	72.701	0.1744	0.2201E+12
385	141.762	1.5	1517.388	2.5	72.694	0.0822	0.1037E+12
386	186.998	3.5	1563.065	3.5	72.671	0.1440	0.1819E+12
387	191.639	1.5	1567.795	0.5	72.666	0.0874	0.1104E+12
388	191.639	1.5	1568.208	2.5	72.644	0.2480	0.3134E+12
389	103.862	2.5	1481.269	2.5	72.600	0.6054	0.7661E+12
390	106.141	1.5	1483.613	2.5	72.597	0.0993	0.1256E+12
391	160.318	2.5	1537.843	1.5	72.594	0.2338	0.2959E+12
392	257.805	2.5	1635.523	2.5	72.584	0.0800	0.1012E+12
393	160.318	2.5	1538.376	2.5	72.566	0.5389	0.6826E+12
394	160.054	3.5	1538.376	2.5	72.552	0.1166	0.1478E+12
395	103.862	2.5	1483.613	2.5	72.477	0.1281	0.1626E+12
396	273.140	4.5	1653.274	3.5	72.457	0.1319	0.1676E+12
397	195.086	3.5	1575.865	2.5	72.423	0.1300	0.1653E+12
398	359.083	2.5	1740.012	2.5	72.415	0.5742	0.7303E+12
399	273.140	4.5	1654.099	4.5	72.413	0.1884	0.2396E+12
400	221.443	2.5	1602.613	2.5	72.402	0.1118	0.1423E+12

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
401	151.782	6.5	1533.234	6.5	72.388	4.6350	0.5900E+13
402	199.321	2.5	1581.423	3.5	72.354	0.3901	0.4970E+12
403	99.184	3.5	1481.269	2.5	72.354	0.6859	0.8739E+12
404	186.998	3.5	1570.659	3.5	72.272	1.3904	0.1775E+13
405	324.259	1.5	1708.268	2.5	72.254	0.2484	0.3174E+12
406	191.639	1.5	1575.865	2.5	72.243	0.0965	0.1233E+12
407	324.259	1.5	1709.164	0.5	72.207	0.2024	0.2589E+12
408	160.291	1.5	1546.532	1.5	72.138	0.2023	0.2593E+12
409	162.340	4.5	1548.915	4.5	72.120	0.7740	0.9925E+12
410	191.639	1.5	1578.274	1.5	72.117	0.2295	0.2943E+12
411	210.765	3.5	1597.499	3.5	72.112	0.6037	0.7743E+12
412	209.995	4.5	1597.499	3.5	72.072	0.1005	0.1291E+12
413	106.141	1.5	1493.709	1.5	72.069	0.2164	0.2780E+12
414	221.443	2.5	1609.088	2.5	72.065	0.5902	0.7580E+12
415	114.773	0.5	1502.560	1.5	72.057	0.1114	0.1431E+12
416	246.920	1.5	1635.523	2.5	72.015	0.1310	0.1685E+12
417	186.998	3.5	1575.866	3.5	72.001	0.6197	0.7973E+12
418	186.998	3.5	1575.865	2.5	72.001	0.0928	0.1194E+12
419	181.290	4.5	1570.659	3.5	71.975	0.1522	0.1959E+12
420	142.135	5.5	1533.234	6.5	71.886	0.1993	0.2573E+12
421	103.654	4.5	1494.929	4.5	71.877	0.3782	0.4883E+12
422	176.695	2.5	1568.208	2.5	71.864	0.5512	0.7119E+12
423	125.739	3.5	1517.388	2.5	71.857	0.1038	0.1341E+12
424	88.177	2.5	1481.269	2.5	71.783	0.3305	0.4277E+12
425	334.211	0.5	1727.821	1.5	71.756	0.4601	0.5960E+12
426	88.177	2.5	1483.613	2.5	71.662	0.3162	0.4106E+12
427	257.805	2.5	1653.274	3.5	71.660	0.5704	0.7408E+12
428	99.184	3.5	1495.199	2.5	71.633	0.2467	0.3207E+12
429	135.366	2.5	1531.548	3.5	71.624	0.1160	0.1508E+12
430	106.141	1.5	1502.560	1.5	71.612	0.3050	0.3967E+12
431	199.321	2.5	1597.163	1.5	71.539	0.2641	0.3442E+12
432	210.765	3.5	1609.088	2.5	71.514	0.0819	0.1068E+12
433	103.862	2.5	1502.560	1.5	71.495	0.1783	0.2326E+12
434	221.443	2.5	1620.248	3.5	71.490	0.1674	0.2185E+12
435	257.805	2.5	1657.456	1.5	71.446	0.3331	0.4353E+12
436	101.247	5.5	1501.296	5.5	71.426	0.1622	0.2120E+12
437	181.290	4.5	1581.423	3.5	71.422	0.1806	0.2361E+12
438	162.340	4.5	1563.065	3.5	71.392	0.1253	0.1640E+12
439	176.695	2.5	1578.274	1.5	71.348	0.1293	0.1695E+12
440	195.086	3.5	1597.499	3.5	71.306	0.7834	0.1028E+13
441	273.140	4.5	1675.710	4.5	71.298	1.8599	0.2440E+13
442	199.321	2.5	1602.613	2.5	71.261	0.1389	0.1825E+12
443	160.318	2.5	1563.774	1.5	71.253	0.1150	0.1511E+12
444	273.140	4.5	1676.593	5.5	71.253	1.0748	0.1412E+13
445	324.259	1.5	1727.821	1.5	71.247	0.1300	0.1708E+12
446	141.762	1.5	1546.532	1.5	71.186	0.1130	0.1488E+12
447	191.639	1.5	1597.163	1.5	71.148	0.0968	0.1276E+12
448	162.340	4.5	1567.928	4.5	71.145	0.1871	0.2466E+12
449	223.540	0.5	1629.175	1.5	71.142	0.1784	0.2351E+12
450	125.739	3.5	1531.548	3.5	71.133	0.3523	0.4644E+12

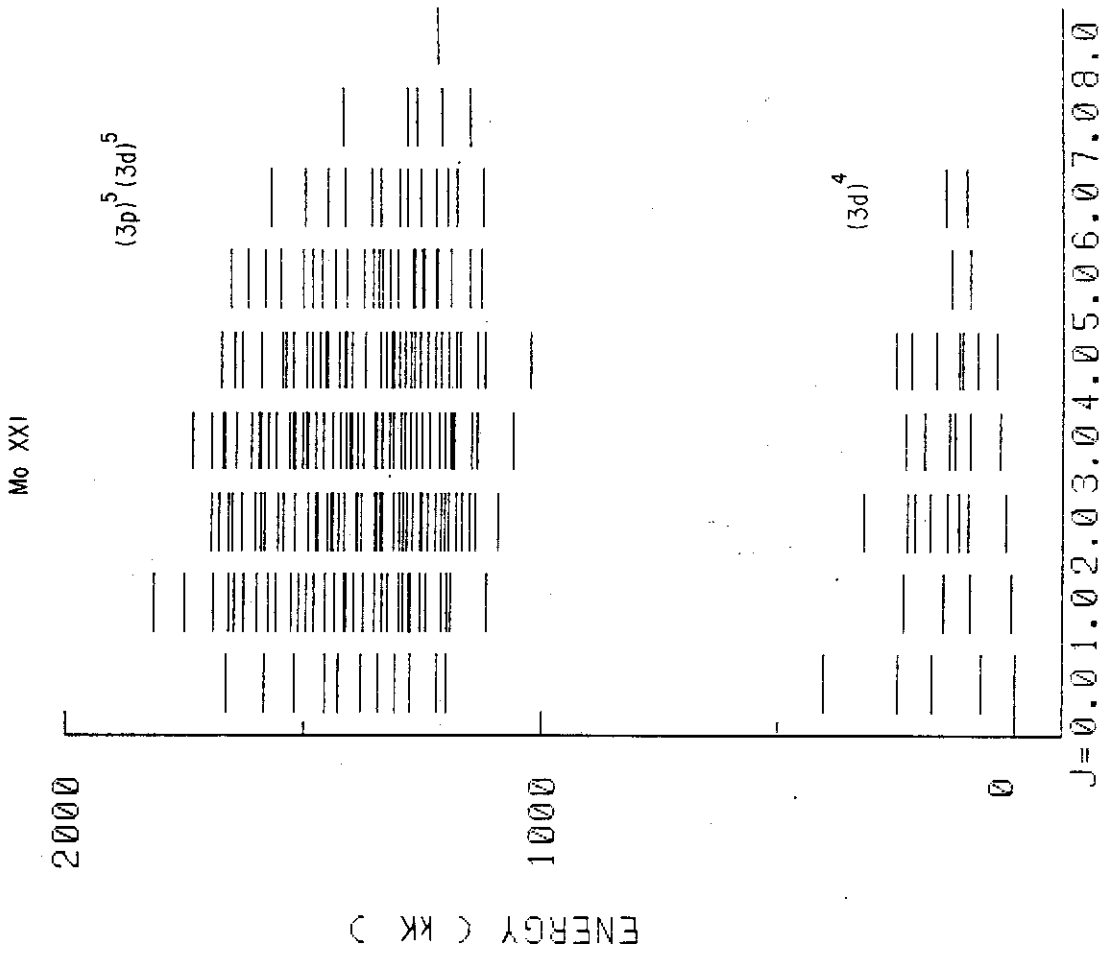
NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
451	246.920	1.5	1652.904	2.5	71.125	0.1267	0.1670E+12
452	142.135	5.5	1548.915	4.5	71.084	0.9472	0.1250E+13
453	160.291	1.5	1567.795	0.5	71.048	0.3353	0.4431E+12
454	195.086	3.5	1602.613	2.5	71.047	0.6871	0.9079E+12
455	160.291	1.5	1568.208	2.5	71.027	0.0958	0.1266E+12
456	334.211	0.5	1742.434	0.5	71.012	0.1527	0.2019E+12
457	210.765	3.5	1620.248	3.5	70.948	0.3144	0.4166E+12
458	359.083	2.5	1769.058	3.5	70.923	1.3269	0.1759E+13
459	160.318	2.5	1570.659	3.5	70.905	0.1344	0.1783E+12
460	246.920	1.5	1657.456	1.5	70.895	0.3611	0.4792E+12
461	160.054	3.5	1570.659	3.5	70.892	0.0891	0.1182E+12
462	366.219	1.5	1776.853	2.5	70.890	0.1783	0.2366E+12
463	103.654	4.5	1515.246	5.5	70.842	0.2433	0.3233E+12
464	125.739	3.5	1538.376	2.5	70.790	0.5576	0.7421E+12
465	277.960	3.5	1691.217	3.5	70.759	2.3219	0.3093E+13
466	195.086	3.5	1609.088	2.5	70.721	0.1882	0.2510E+12
467	101.247	5.5	1515.246	5.5	70.721	0.5571	0.7429E+12
468	221.443	2.5	1635.523	2.5	70.717	0.2343	0.3124E+12
469	135.366	2.5	1549.677	2.5	70.706	0.1199	0.1599E+12
470	88.177	2.5	1502.560	1.5	70.702	0.5342	0.7128E+12
471	366.219	1.5	1780.877	1.5	70.689	0.9178	0.1225E+13
472	160.318	2.5	1575.866	3.5	70.644	0.1525	0.2039E+12
473	277.960	3.5	1693.623	4.5	70.638	0.2026	0.2708E+12
474	324.259	1.5	1740.012	2.5	70.634	0.6461	0.8637E+12
475	160.054	3.5	1575.866	3.5	70.631	0.4174	0.5581E+12
476	181.290	4.5	1597.499	3.5	70.611	0.1137	0.1521E+12
477	359.083	2.5	1776.853	2.5	70.533	1.2603	0.1690E+13
478	209.995	4.5	1627.820	5.5	70.531	0.6450	0.8649E+12
479	160.318	2.5	1578.274	1.5	70.524	0.4385	0.5880E+12
480	273.140	4.5	1691.217	3.5	70.518	0.3157	0.4234E+12
481	324.259	1.5	1742.434	0.5	70.513	0.5581	0.7487E+12
482	186.998	3.5	1605.284	4.5	70.508	0.0899	0.1206E+12
483	210.765	3.5	1629.291	4.5	70.496	0.0809	0.1086E+12
484	199.321	2.5	1617.866	1.5	70.495	0.3050	0.4094E+12
485	162.340	4.5	1581.423	3.5	70.468	1.4291	0.1920E+13
486	209.995	4.5	1629.291	4.5	70.457	1.0369	0.1393E+13
487	277.960	3.5	1698.092	3.5	70.416	0.2696	0.3627E+12
488	273.140	4.5	1693.623	4.5	70.399	0.1331	0.1791E+12
489	176.695	2.5	1597.163	1.5	70.399	0.5010	0.6742E+12
490	176.695	2.5	1597.499	3.5	70.383	0.1603	0.2159E+12
491	359.083	2.5	1780.877	1.5	70.334	0.7276	0.9810E+12
492	141.762	1.5	1563.774	1.5	70.323	0.1557	0.2100E+12
493	125.739	3.5	1549.677	2.5	70.228	0.3282	0.4438E+12
494	181.290	4.5	1605.284	4.5	70.225	0.6074	0.8214E+12
495	195.086	3.5	1620.248	3.5	70.167	0.4694	0.6359E+12
496	202.081	5.5	1627.820	5.5	70.139	4.1553	0.5634E+13
497	142.135	5.5	1567.928	4.5	70.136	0.2973	0.4032E+12
498	141.762	1.5	1567.795	0.5	70.125	0.1045	0.1418E+12
499	221.443	2.5	1647.499	3.5	70.123	0.0843	0.1144E+12
500	88.177	2.5	1515.655	1.5	70.054	0.1336	0.1816E+12

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
501	103.654	4.5	1531.548	3.5	70.033	0.4780	0.6500E+12
502	135.366	2.5	1563.774	1.5	70.008	0.7304	0.9940E+12
503	199.321	2.5	1629.175	1.5	69.937	0.5905	0.8053E+12
504	137.801	0.5	1567.795	0.5	69.930	0.3284	0.4478E+12
505	277.960	3.5	1708.268	2.5	69.915	0.1461	0.1994E+12
506	257.805	2.5	1688.622	1.5	69.890	0.6695	0.9142E+12
507	114.773	0.5	1546.532	1.5	69.844	0.1271	0.1738E+12
508	221.443	2.5	1653.274	3.5	69.841	0.5842	0.7988E+12
509	99.184	3.5	1531.548	3.5	69.815	0.1115	0.1526E+12
510	135.366	2.5	1568.208	2.5	69.791	0.1569	0.2149E+12
511	186.998	3.5	1620.248	3.5	69.771	0.2256	0.3092E+12
512	246.920	1.5	1680.373	2.5	69.762	0.1686	0.2310E+12
513	223.540	0.5	1657.456	1.5	69.739	0.6510	0.8927E+12
514	103.862	2.5	1537.843	1.5	69.736	0.1797	0.2464E+12
515	246.920	1.5	1682.103	0.5	69.678	0.6398	0.8790E+12
516	199.321	2.5	1635.523	2.5	69.628	0.1780	0.2449E+12
517	141.762	1.5	1577.979	0.5	69.627	0.5798	0.7977E+12
518	210.765	3.5	1647.499	3.5	69.602	0.1960	0.2698E+12
519	191.639	1.5	1628.697	0.5	69.587	0.5195	0.7155E+12
520	125.739	3.5	1563.065	3.5	69.574	0.0949	0.1307E+12
521	160.054	3.5	1597.499	3.5	69.568	0.1053	0.1451E+12
522	209.995	4.5	1647.499	3.5	69.565	0.3101	0.4275E+12
523	257.805	2.5	1696.061	2.5	69.529	1.1198	0.1545E+13
524	181.290	4.5	1620.248	3.5	69.495	1.4284	0.1973E+13
525	99.184	3.5	1538.376	2.5	69.483	0.3305	0.4566E+12
526	137.801	0.5	1577.979	0.5	69.436	0.1903	0.2632E+12
527	257.805	2.5	1698.092	3.5	69.431	0.3181	0.4401E+12
528	195.086	3.5	1635.523	2.5	69.423	0.2888	0.3997E+12
529	186.998	3.5	1629.291	4.5	69.334	0.0924	0.1282E+12
530	125.739	3.5	1568.208	2.5	69.326	0.2458	0.3411E+12
531	160.054	3.5	1602.613	2.5	69.321	0.8940	0.1241E+13
532	103.862	2.5	1546.532	1.5	69.316	0.4401	0.6109E+12
533	366.219	1.5	1808.941	0.5	69.313	0.6233	0.8653E+12
534	135.366	2.5	1578.274	1.5	69.305	0.1483	0.2059E+12
535	162.340	4.5	1605.284	4.5	69.303	0.5663	0.7864E+12
536	209.995	4.5	1653.274	3.5	69.287	0.1251	0.1739E+12
537	210.765	3.5	1654.099	4.5	69.284	0.4260	0.5919E+12
538	209.995	4.5	1654.099	4.5	69.247	1.3073	0.1818E+13
539	125.739	3.5	1570.659	3.5	69.208	0.2813	0.3917E+12
540	160.054	3.5	1605.284	4.5	69.193	0.1553	0.2163E+12
541	103.862	2.5	1549.677	2.5	69.165	0.1003	0.1398E+12
542	334.211	0.5	1780.877	1.5	69.124	0.3184	0.4445E+12
543	101.247	5.5	1548.915	4.5	69.077	0.1074	0.1501E+12
544	181.290	4.5	1629.291	4.5	69.061	0.1970	0.2755E+12
545	199.321	2.5	1647.499	3.5	69.052	0.1028	0.1438E+12
546	114.773	0.5	1563.774	1.5	69.013	0.2941	0.4118E+12
547	160.054	3.5	1609.088	2.5	69.012	0.0943	0.1320E+12
548	246.920	1.5	1696.061	2.5	69.006	0.2581	0.3615E+12
549	366.219	1.5	1815.564	1.5	68.997	1.1999	0.1681E+13
550	88.177	2.5	1537.843	1.5	68.981	0.0837	0.1173E+12

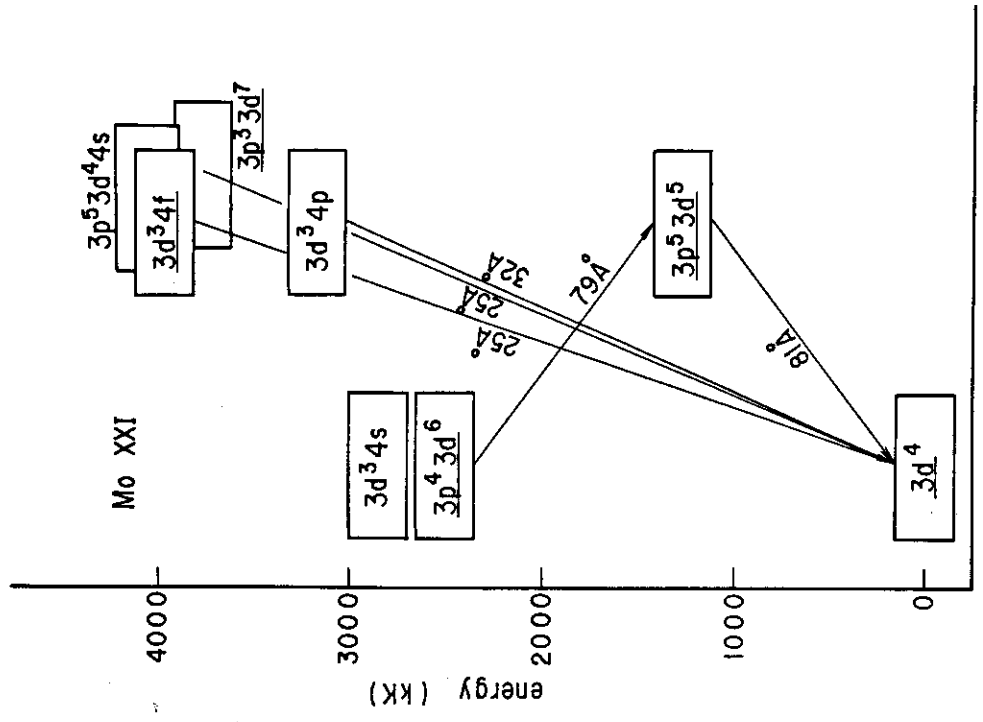
NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
551	125.739	3.5	1575.866	3.5	68.960	0.1037	0.1455E+12
552	257.805	2.5	1708.268	2.5	68.943	0.3349	0.4699E+12
553	99.184	3.5	1549.677	2.5	68.942	0.3258	0.4572E+12
554	176.695	2.5	1629.175	1.5	68.848	0.7701	0.1084E+13
555	324.259	1.5	1776.853	2.5	68.842	0.1996	0.2810E+12
556	221.443	2.5	1676.784	1.5	68.712	1.4727	0.2080E+13
557	125.739	3.5	1581.423	3.5	68.696	0.1199	0.1695E+12
558	359.083	2.5	1815.564	1.5	68.659	1.1172	0.1581E+13
559	324.259	1.5	1780.877	1.5	68.652	0.1174	0.1661E+12
560	106.141	1.5	1563.774	1.5	68.604	0.3115	0.4414E+12
561	162.340	4.5	1620.248	3.5	68.591	1.2456	0.1766E+13
562	199.321	2.5	1657.456	1.5	68.581	0.1068	0.1515E+12
563	88.177	2.5	1546.532	1.5	68.570	0.2218	0.3146E+12
564	223.540	0.5	1682.103	0.5	68.561	0.1978	0.2807E+12
565	160.318	2.5	1620.248	3.5	68.496	0.1231	0.1750E+12
566	160.054	3.5	1620.248	3.5	68.484	0.2285	0.3249E+12
567	277.960	3.5	1740.012	2.5	68.397	1.4788	0.2108E+13
568	246.920	1.5	1709.164	0.5	68.388	0.1274	0.1816E+12
569	209.995	4.5	1675.710	4.5	68.226	0.1796	0.2574E+12
570	186.998	3.5	1652.904	2.5	68.217	2.2766	0.3263E+13
571	181.290	4.5	1647.499	3.5	68.203	1.8052	0.2588E+13
572	186.998	3.5	1653.274	3.5	68.200	0.0841	0.1206E+12
573	101.247	5.5	1567.928	4.5	68.181	0.4057	0.5820E+12
574	103.654	4.5	1570.659	3.5	68.166	1.3151	0.1888E+13
575	186.998	3.5	1654.099	4.5	68.162	0.1945	0.2793E+12
576	221.443	2.5	1688.622	1.5	68.158	0.4536	0.6513E+12
577	135.366	2.5	1602.613	2.5	68.155	0.0912	0.1310E+12
578	160.291	1.5	1628.697	0.5	68.101	0.5697	0.8193E+12
579	160.318	2.5	1629.175	1.5	68.080	0.3258	0.4689E+12
580	160.291	1.5	1629.175	1.5	68.079	0.1093	0.1573E+12
581	99.184	3.5	1568.208	2.5	68.072	0.7760	0.1117E+13
582	210.765	3.5	1680.373	2.5	68.045	1.5582	0.2245E+13
583	221.443	2.5	1691.217	3.5	68.038	0.0869	0.1252E+12
584	257.805	2.5	1727.821	1.5	68.026	0.3974	0.5728E+12
585	99.184	3.5	1570.659	3.5	67.959	0.4672	0.6748E+12
586	181.290	4.5	1653.274	3.5	67.936	0.1321	0.1909E+12
587	103.654	4.5	1575.866	3.5	67.925	0.9505	0.1374E+13
588	181.290	4.5	1654.099	4.5	67.897	0.4272	0.6180E+12
589	202.081	5.5	1675.710	4.5	67.860	0.3560	0.5156E+12
590	334.211	0.5	1808.941	0.5	67.809	0.1157	0.1678E+12
591	160.054	3.5	1635.523	2.5	67.775	1.7966	0.2609E+13
592	151.782	6.5	1627.820	5.5	67.749	0.2521	0.3663E+12
593	176.695	2.5	1652.904	2.5	67.741	0.0970	0.1410E+12
594	99.184	3.5	1575.866	3.5	67.719	0.4123	0.5997E+12
595	199.321	2.5	1676.784	1.5	67.684	0.1681	0.2447E+12
596	103.654	4.5	1581.423	3.5	67.670	0.1399	0.2037E+12
597	88.177	2.5	1568.208	2.5	67.566	0.1397	0.2041E+12
598	210.765	3.5	1691.217	3.5	67.547	0.1006	0.1471E+12
599	176.695	2.5	1657.456	1.5	67.533	0.5726	0.8374E+12
600	246.920	1.5	1727.821	1.5	67.526	0.5020	0.7342E+12

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
601	209.995	4.5	1691.217	3.5	67.512	0.3015	0.4413E+12
602	334.211	0.5	1815.564	1.5	67.506	0.1841	0.2695E+12
603	210.765	3.5	1693.623	4.5	67.437	0.1839	0.2698E+12
604	209.995	4.5	1693.623	4.5	67.402	0.1408	0.2067E+12
605	324.259	1.5	1808.941	0.5	67.354	0.2425	0.3566E+12
606	162.340	4.5	1647.499	3.5	67.333	1.0919	0.1606E+13
607	195.086	3.5	1680.373	2.5	67.327	0.4713	0.6935E+12
608	221.443	2.5	1708.268	2.5	67.257	0.4553	0.6713E+12
609	141.762	1.5	1628.697	0.5	67.252	0.1121	0.1653E+12
610	142.135	5.5	1629.291	4.5	67.242	1.9023	0.2806E+13
611	210.765	3.5	1698.092	3.5	67.235	0.1311	0.1934E+12
612	209.995	4.5	1698.092	3.5	67.200	3.7249	0.5502E+13
613	191.639	1.5	1682.103	0.5	67.093	0.1902	0.2819E+12
614	162.340	4.5	1653.274	3.5	67.072	0.2741	0.4064E+12
615	277.960	3.5	1769.058	3.5	67.065	0.2527	0.3748E+12
616	324.259	1.5	1815.564	1.5	67.055	0.4493	0.6665E+12
617	202.081	5.5	1693.623	4.5	67.045	6.6862	0.9921E+13
618	160.318	2.5	1652.904	2.5	66.998	0.3343	0.4968E+12
619	186.998	3.5	1680.373	2.5	66.962	0.2603	0.3872E+12
620	141.762	1.5	1635.523	2.5	66.945	0.0827	0.1231E+12
621	135.366	2.5	1629.175	1.5	66.943	0.2316	0.3447E+12
622	103.654	4.5	1597.499	3.5	66.941	0.2715	0.4041E+12
623	181.290	4.5	1675.710	4.5	66.916	0.3607	0.5373E+12
624	246.920	1.5	1742.434	0.5	66.867	0.1245	0.1857E+12
625	273.140	4.5	1769.058	3.5	66.849	4.6515	0.6943E+13
626	195.086	3.5	1691.217	3.5	66.839	0.3438	0.5132E+12
627	191.639	1.5	1688.622	1.5	66.801	0.1252	0.1872E+12
628	160.291	1.5	1657.456	1.5	66.793	0.0840	0.1255E+12
629	210.765	3.5	1708.268	2.5	66.778	1.3807	0.2065E+13
630	199.321	2.5	1698.092	3.5	66.721	0.1923	0.2881E+12
631	277.960	3.5	1776.853	2.5	66.716	1.8948	0.2839E+13
632	135.366	2.5	1635.523	2.5	66.660	0.3707	0.5565E+12
633	195.086	3.5	1696.061	2.5	66.623	1.3008	0.1955E+13
634	103.654	4.5	1605.284	4.5	66.594	0.7958	0.1197E+13
635	195.086	3.5	1698.092	3.5	66.533	0.2499	0.3766E+12
636	101.247	5.5	1605.284	4.5	66.488	4.0199	0.6065E+13
637	199.321	2.5	1708.268	2.5	66.271	0.1300	0.1974E+12
638	176.695	2.5	1688.622	1.5	66.141	0.0843	0.1286E+12
639	142.135	5.5	1654.099	4.5	66.139	1.4563	0.2221E+13
640	195.086	3.5	1708.268	2.5	66.086	0.2879	0.4398E+12
641	162.340	4.5	1675.710	4.5	66.078	0.4855	0.7417E+12
642	160.318	2.5	1676.784	1.5	65.943	0.1416	0.2172E+12
643	103.654	4.5	1620.248	3.5	65.937	0.1232	0.1889E+12
644	181.290	4.5	1698.092	3.5	65.928	0.8235	0.1264E+13
645	191.639	1.5	1709.164	0.5	65.897	0.1238	0.1901E+12
646	257.805	2.5	1776.853	2.5	65.831	0.0866	0.1333E+12
647	160.054	3.5	1680.373	2.5	65.776	0.2470	0.3807E+12
648	186.998	3.5	1708.268	2.5	65.735	0.1971	0.3042E+12
649	125.739	3.5	1647.499	3.5	65.713	0.6629	0.1024E+13
650	160.291	1.5	1682.103	0.5	65.711	0.0981	0.1515E+12

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
651	151.782	6.5	1676.593	5.5	65.582	8.7367	0.1355E+14
652	103.654	4.5	1629.291	4.5	65.546	0.1148	0.1783E+12
653	125.739	3.5	1653.274	3.5	65.465	0.1068	0.1662E+12
654	101.247	5.5	1629.291	4.5	65.443	0.6952	0.1083E+13
655	199.321	2.5	1727.821	1.5	65.424	0.3442	0.5363E+12
656	142.135	5.5	1675.710	4.5	65.207	2.6097	0.4094E+13
657	142.135	5.5	1676.593	5.5	65.170	0.2823	0.4434E+12
658	191.639	1.5	1727.821	1.5	65.096	0.0816	0.1284E+12
659	103.862	2.5	1647.499	3.5	64.782	0.1298	0.2064E+12
660	103.654	4.5	1647.499	3.5	64.773	0.2623	0.4170E+12
661	195.086	3.5	1740.012	2.5	64.728	0.0815	0.1298E+12
662	103.654	4.5	1653.274	3.5	64.532	0.1843	0.2951E+12
663	191.639	1.5	1742.434	0.5	64.483	0.1004	0.1610E+12
664	142.135	5.5	1693.623	4.5	64.454	0.4374	0.7022E+12
665	101.247	5.5	1654.099	4.5	64.398	0.0917	0.1474E+12
666	99.184	3.5	1652.904	2.5	64.362	0.1685	0.2713E+12
667	257.805	2.5	1815.564	1.5	64.195	0.0800	0.1295E+12
668	160.318	2.5	1727.821	1.5	63.796	0.0834	0.1366E+12
669	160.054	3.5	1740.012	2.5	63.293	0.1743	0.2901E+12
670	195.086	3.5	1776.853	2.5	63.220	0.2349	0.3920E+12
671	181.290	4.5	1769.058	3.5	62.981	0.1430	0.2405E+12
672	221.443	2.5	1815.564	1.5	62.730	0.1114	0.1889E+12
673	176.695	2.5	1776.853	2.5	62.494	0.0917	0.1565E+12
674	162.340	4.5	1769.058	3.5	62.239	0.0991	0.1707E+12



Mo XXI　エネルギー・レベル
$(3d)^4$, $(3p)^5(3d)^5$



Mo XXI　グロトリアン・ダイアグラム

Mo XXI　エネルギーレベル

EVEN　$(3d)^4$

ODD　$(3p)^5\ (3d)^5$

EVEN PARITY

J	NO	ENERGY(KK)		LEADING PERCENTAGES			
0.0	1	0.000	---	1	5D 78.5%	1	3P 11.1%
0.0	2	73.746	---	1	3P 39.4%	1	3P 27.2%
0.0	3	176.117	---	1	1S 63.9%	1	1S 18.0%
0.0	4	248.963	---	1	3P 58.9%	1	3P 33.4%
0.0	5	405.232	---	1	1S 77.8%	1	1S 19.0%
1.0	1	10.449	---	1	5D 90.2%	1	3P 5.6%
1.0	2	99.152	---	1	3P 55.4%	1	3P 30.0%
1.0	3	154.459	---	1	3D 92.2%	1	3P 4.7%
1.0	4	237.602	---	1	3P 59.7%	1	3P 38.9%
2.0	1	21.736	---	1	5D 95.3%	1	3P 1.8%
2.0	2	101.506	---	1	3F 59.5%	1	3F 22.8%
2.0	3	123.982	---	1	3P 47.9%	1	3D 31.9%
2.0	4	147.292	---	1	3D 37.1%	1	3P 18.9%
2.0	5	182.887	---	1	1D 39.8%	1	3D 19.1%
2.0	6	214.468	---	1	3P 58.1%	1	3P 25.3%
2.0	7	228.968	---	1	3F 51.5%	1	3F 27.1%
2.0	8	320.378	---	1	1D 77.5%	1	1D 19.4%
3.0	1	32.094	---	1	5D 93.6%	1	3F 2.3%
3.0	2	97.267	---	1	3G 59.6%	1	3F 21.5%
3.0	3	128.882	---	1	3F 57.3%	1	3G 30.4%
3.0	4	140.212	---	1	3D 81.4%	1	1F 6.2%
3.0	5	193.931	---	1	1F 72.4%	1	3D 13.0%
3.0	6	232.278	---	1	3F 65.0%	1	3F 17.4%
4.0	1	41.037	---	1	5D 85.3%	1	3F 8.9%
4.0	2	80.010	---	1	3H 63.4%	1	3G 14.2%
4.0	3	114.225	---	1	3G 32.0%	1	3F 28.2%
4.0	4	123.756	---	1	3G 40.9%	1	3F 23.0%
4.0	5	170.293	---	1	1G 43.1%	1	3F 26.5%
4.0	6	220.438	---	1	3F 77.1%	1	1G 14.2%
4.0	7	252.027	---	1	1G 56.6%	1	1G 28.5%
5.0	1	96.822	---	1	3H 81.8%	1	3G 18.2%
5.0	2	139.509	---	1	3G 81.8%	1	3H 18.2%
6.0	1	104.844	---	1	3H 81.5%	1	1I 18.5%
6.0	2	148.200	---	1	1I 81.5%	1	3H 18.5%

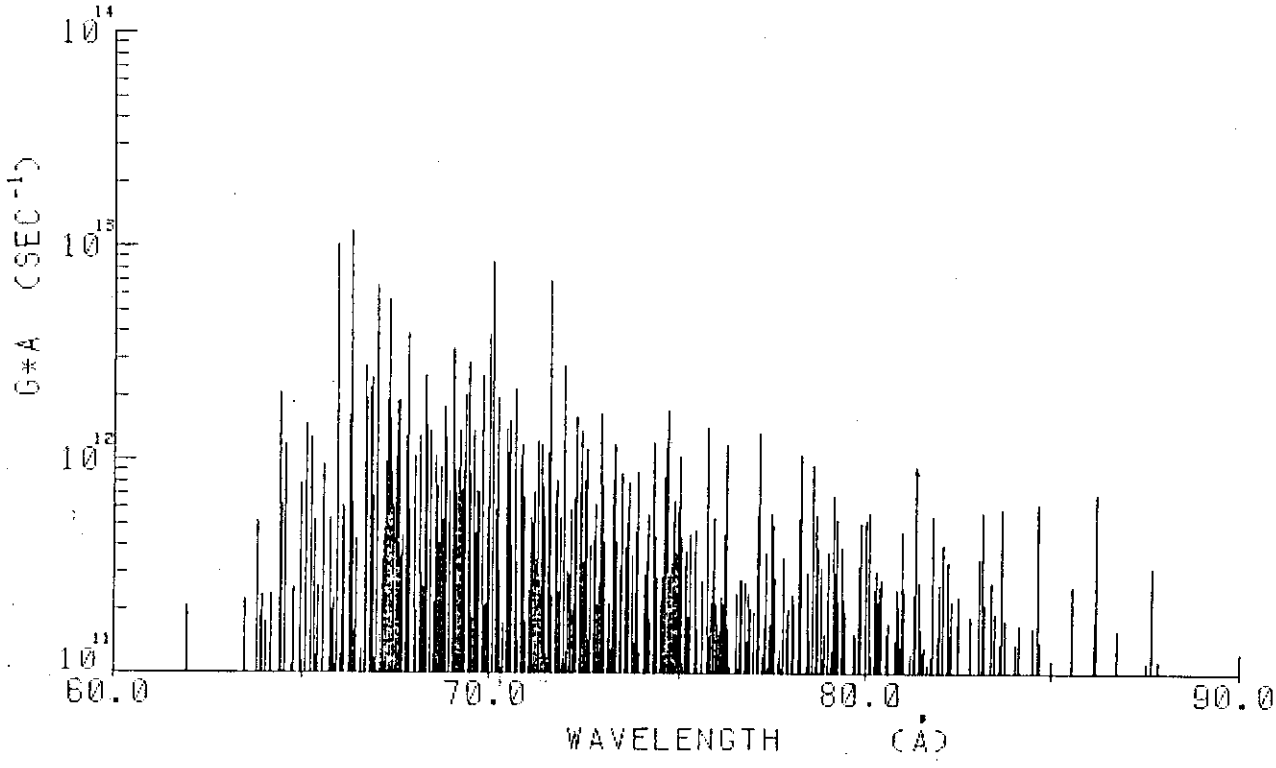
ODD J	PARITY NO	ENERGY(KK)		LEADING PERCENTAGES	
0.0	1	1203.843	---	1 (4P) 3P 34.6%	1 (2D) 3P 24.5%
0.0	2	1222.433	---	1 (4D) 5D 33.6%	1 (4P) 5D 16.9%
0.0	3	1279.330	---	1 (4F) 5D 57.2%	1 (2D) 3P 22.4%
0.0	4	1310.731	---	1 (4D) 5D 47.2%	1 (2D) 3P 25.8%
0.0	5	1345.681	---	1 (4P) 5D 41.3%	1 (4F) 5D 24.6%
0.0	6	1383.470	---	1 (2P) 1S 66.1%	1 (2P) 3P 22.0%
0.0	7	1429.093	---	1 (2D) 3P 53.7%	1 (2P) 1S 13.1%
0.0	8	1457.014	---	1 (4P) 3P 32.1%	1 (4D) 3P 15.6%
0.0	9	1522.908	---	1 (2S) 3P 61.2%	1 (2D) 3P 15.3%
0.0	10	1585.673	---	1 (2P) 3P 69.5%	1 (2P) 1S 19.1%
0.0	11	1666.976	---	1 (4D) 3P 57.2%	1 (2D) 3P 12.1%
1.0	1	1118.276	---	1 (4D) 5P 51.5%	1 (6S) 5P 32.1%
1.0	2	1192.155	---	1 (4P) 3P 16.4%	1 (2D) 3P 12.3%
1.0	3	1203.131	---	1 (4P) 5D 23.1%	1 (4P) 3D 13.5%
1.0	4	1214.652	---	1 (4D) 5F 19.8%	1 (4G) 5F 17.5%
1.0	5	1247.232	---	1 (4F) 5F 31.4%	1 (4F) 3D 12.2%
1.0	6	1258.668	---	1 (4G) 5F 32.3%	1 (4F) 5D 21.5%
1.0	7	1276.967	---	1 (4P) 5P 25.7%	1 (2D) 3D 8.7%
1.0	8	1281.072	---	1 (4G) 5F 20.6%	1 (4D) 5F 16.5%
1.0	9	1295.294	---	1 (4F) 5D 29.5%	1 (4P) 3D 11.4%
1.0	10	1303.667	---	1 (2F) 3D 21.8%	1 (2F) 3D 18.1%
1.0	11	1327.806	---	1 (4D) 5D 19.4%	1 (4P) 5P 17.3%
1.0	12	1336.802	---	1 (4P) 5D 35.2%	1 (2F) 3D 18.1%
1.0	13	1355.722	---	1 (2D) 3D 13.6%	1 (4F) 5D 11.3%
1.0	14	1376.208	---	1 (4D) 5F 23.4%	1 (4F) 5F 12.5%
1.0	15	1397.654	---	1 (6S) 5P 15.2%	1 (2P) 3P 13.3%
1.0	16	1413.861	---	1 (2P) 3P 14.3%	1 (2D) 3P 13.2%
1.0	17	1417.662	---	1 (2S) 1P 16.6%	1 (2D) 3P 11.9%
1.0	18	1437.706	---	1 (2F) 3D 19.1%	1 (4P) 3D 13.0%
1.0	19	1457.906	---	1 (4P) 3P 17.6%	1 (6S) 5P 15.0%
1.0	20	1482.418	---	1 (2S) 3P 30.9%	1 (2D) 1P 11.5%
1.0	21	1497.987	---	1 (2D) 3D 14.9%	1 (2P) 3D 14.7%
1.0	22	1514.745	---	1 (2D) 3P 21.2%	1 (2P) 3S 15.2%
1.0	23	1530.699	---	1 (4P) 3D 17.1%	1 (4D) 3D 15.7%
1.0	24	1560.052	---	1 (2D) 3D 13.8%	1 (2D) 3P 12.8%
1.0	25	1578.465	---	1 (4P) 3S 23.8%	1 (2P) 3P 21.1%
1.0	26	1602.603	---	1 (2D) 3D 37.7%	1 (2D) 1P 10.3%
1.0	27	1630.731	---	1 (4P) 3S 25.8%	1 (2P) 3S 19.2%
1.0	28	1650.354	---	1 (2D) 1P 25.7%	1 (2S) 1P 18.6%
1.0	29	1660.434	---	1 (4D) 3P 29.3%	1 (2D) 3P 11.2%
1.0	30	1692.192	---	1 (4F) 3D 40.3%	1 (2P) 3D 23.8%
1.0	31	1754.806	---	1 (2P) 1P 50.1%	1 (2D) 1P 16.7%
1.0	32	1816.466	---	1 (2D) 1P 45.1%	1 (2P) 1P 17.3%
2.0	1	1092.235	---	1 (6S) 7P 37.0%	1 (6S) 5P 22.6%
2.0	2	1141.062	---	1 (4G) 5G 46.9%	1 (2F) 3F 12.0%
2.0	3	1155.905	---	1 (4P) 5S 55.5%	1 (4P) 5P 13.4%
2.0	4	1170.058	---	1 (6S) 7P 23.1%	1 (4P) 5D 21.7%
2.0	5	1181.436	---	1 (4D) 5P 31.3%	1 (6S) 7P 26.2%
2.0	6	1196.822	---	1 (4G) 5G 11.0%	1 (4P) 3D 9.8%

ODD PARITY J	NO	ENERGY(KK)		LEADING PERCENTAGES	
2.0	7	1204.746	---	1 (2G) 3F 21.5%	1 (4D) 3F 17.4%
2.0	8	1214.449	---	1 (4G) 5F 12.2%	1 (4D) 5F 10.2%
2.0	9	1225.252	---	1 (4F) 5F 10.0%	1 (2S) 3P 9.1%
2.0	10	1240.442	---	1 (2F) 3F 15.9%	1 (2F) 1D 15.2%
2.0	11	1255.662	---	1 (4G) 5F 16.9%	1 (4F) 5F 12.9%
2.0	12	1259.518	---	1 (2F) 3F 14.3%	1 (4P) 5P 12.8%
2.0	13	1272.417	---	1 (2S) 3P 18.2%	1 (4P) 5D 7.8%
2.0	14	1285.326	---	1 (4G) 5F 23.0%	1 (2F) 1D 12.1%
2.0	15	1292.496	---	1 (4G) 5F 15.4%	1 (4D) 5F 10.0%
2.0	16	1301.648	---	1 (4F) 5D 17.8%	1 (4F) 5G 13.8%
2.0	17	1315.066	---	1 (4D) 5F 13.7%	1 (4D) 5D 13.6%
2.0	18	1336.256	---	1 (4D) 5D 20.8%	1 (4P) 5D 13.5%
2.0	19	1342.425	---	1 (2F) 3D 22.4%	1 (4F) 5G 12.3%
2.0	20	1349.466	---	1 (4F) 5D 12.7%	1 (4F) 5G 10.8%
2.0	21	1353.833	---	1 (2P) 3P 13.9%	1 (2D) 3D 11.3%
2.0	22	1381.754	---	1 (2G) 3F 22.7%	1 (4F) 5G 10.6%
2.0	23	1388.380	---	1 (2P) 3P 11.2%	1 (4D) 3D 10.6%
2.0	24	1392.583	---	1 (2P) 3D 9.0%	1 (4P) 5P 7.0%
2.0	25	1417.057	---	1 (4F) 5G 12.6%	1 (2P) 3D 8.6%
2.0	26	1429.248	---	1 (2P) 3P 22.5%	1 (2D) 3P 9.3%
2.0	27	1440.808	---	1 (2G) 3F 12.5%	1 (2D) 1D 9.9%
2.0	28	1446.597	---	1 (2F) 3D 19.3%	1 (2P) 1D 11.6%
2.0	29	1455.798	---	1 (4D) 3P 15.4%	1 (4P) 5P 11.3%
2.0	30	1475.888	---	1 (4D) 3F 15.8%	1 (6S) 5P 13.9%
2.0	31	1477.430	---	1 (6S) 5P 33.6%	1 (4D) 5P 10.9%
2.0	32	1495.558	---	1 (2D) 3F 21.5%	1 (2D) 3P 18.1%
2.0	33	1521.243	---	1 (2F) 3D 21.9%	1 (2F) 3D 14.1%
2.0	34	1523.215	---	1 (2D) 3D 19.4%	1 (2D) 3F 18.5%
2.0	35	1546.890	---	1 (2D) 3D 17.0%	1 (4P) 3D 14.2%
2.0	36	1547.989	---	1 (4G) 3F 19.8%	1 (2F) 1D 10.8%
2.0	37	1559.242	---	1 (4P) 3D 11.8%	1 (2D) 3D 9.5%
2.0	38	1585.268	---	1 (2D) 3F 11.5%	1 (4F) 3D 10.8%
2.0	39	1592.977	---	1 (4D) 3P 15.1%	1 (2D) 3P 14.2%
2.0	40	1605.244	---	1 (2D) 3F 14.7%	1 (4F) 3F 13.4%
2.0	41	1635.871	---	1 (2D) 1D 18.1%	1 (2P) 1D 15.9%
2.0	42	1653.757	---	1 (4D) 3P 11.5%	1 (2P) 1D 11.2%
2.0	43	1661.621	---	1 (4F) 3F 17.0%	1 (2D) 1D 13.4%
2.0	44	1680.923	---	1 (2D) 1D 14.8%	1 (2D) 1D 14.1%
2.0	45	1696.256	---	1 (4F) 3D 30.2%	1 (2P) 3D 19.3%
3.0	1	1063.641	---	1 (6S) 7P 74.8%	1 (6S) 5P 12.3%
3.0	2	1139.934	---	1 (4G) 5G 59.2%	1 (2F) 3F 10.0%
3.0	3	1148.597	---	1 (4P) 5D 37.1%	1 (4D) 5F 21.1%
3.0	4	1185.943	---	1 (4D) 5P 29.7%	1 (6S) 7P 13.6%
3.0	5	1191.565	---	1 (4P) 5P 14.8%	1 (2D) 3D 11.8%
3.0	6	1195.006	---	1 (4P) 5D 16.7%	1 (4D) 5F 14.3%
3.0	7	1206.115	---	1 (2D) 3D 10.9%	1 (2G) 3F 8.9%
3.0	8	1217.680	---	1 (4G) 3F 13.1%	1 (2D) 3F 11.9%
3.0	9	1238.349	---	1 (4G) 5H 35.4%	1 (2F) 3G 14.0%
3.0	10	1255.447	---	1 (4F) 5F 23.1%	1 (4D) 5P 7.0%

ODD J	PARITY NO	ENERGY(KK)		LEADING PERCENTAGES	
3.0	11	1265.712	---	1 (2F) 3F 12.8%	1 (4F) 5G 11.3%
3.0	12	1276.750	---	1 (2F) 3F 16.3%	1 (4P) 5P 11.0%
3.0	13	1279.808	---	1 (2H) 3G 16.4%	1 (4F) 3G 13.6%
3.0	14	1291.866	---	1 (2D) 1F 13.5%	1 (4F) 5D 13.2%
3.0	15	1299.637	---	1 (4G) 5F 27.6%	1 (2G) 3F 8.3%
3.0	16	1313.478	---	1 (4F) 5D 15.0%	1 (4D) 5F 8.9%
3.0	17	1322.012	---	1 (4D) 5D 9.2%	1 (4F) 5D 8.3%
3.0	18	1338.208	---	1 (4D) 5D 15.5%	1 (4D) 5F 14.3%
3.0	19	1339.972	---	1 (2D) 1F 14.1%	1 (4G) 5H 8.7%
3.0	20	1349.602	---	1 (2G) 3G 21.6%	1 (2H) 3G 10.3%
3.0	21	1354.499	---	1 (2D) 3D 20.9%	1 (2D) 1F 17.2%
3.0	22	1377.052	---	1 (2D) 3D 19.6%	1 (2D) 3F 12.4%
3.0	23	1389.752	---	1 (4F) 5G 14.1%	1 (2H) 3G 10.3%
3.0	24	1400.862	---	1 (4F) 5D 19.7%	1 (2P) 3D 10.1%
3.0	25	1407.688	---	1 (2F) 3G 15.5%	1 (2H) 3G 12.9%
3.0	26	1415.218	---	1 (2P) 3D 21.3%	1 (2F) 3G 20.6%
3.0	27	1426.153	---	1 (2F) 3G 25.5%	1 (2G) 1F 12.3%
3.0	28	1442.950	---	1 (4F) 3G 16.0%	1 (4F) 5D 9.3%
3.0	29	1462.801	---	1 (2D) 3F 17.2%	1 (2G) 3G 12.3%
3.0	30	1477.271	---	1 (2F) 3D 18.2%	1 (4D) 3D 17.1%
3.0	31	1494.279	---	1 (2G) 3F 13.4%	1 (2D) 3F 10.8%
3.0	32	1497.695	---	1 (2G) 3G 14.7%	1 (4F) 3G 10.2%
3.0	33	1507.716	---	1 (2D) 3D 18.0%	1 (2D) 3F 10.7%
3.0	34	1520.887	---	1 (6S) 5P 14.7%	1 (2F) 1F 11.7%
3.0	35	1527.115	---	1 (6S) 5P 23.6%	1 (2F) 3D 12.5%
3.0	36	1533.773	---	1 (2D) 1F 7.9%	1 (2D) 3F 7.3%
3.0	37	1561.252	---	1 (4D) 3F 17.4%	1 (4G) 3G 10.8%
3.0	38	1579.544	---	1 (4D) 3D 20.5%	1 (4G) 3G 17.5%
3.0	39	1594.479	---	1 (2G) 1F 15.4%	1 (4P) 3D 15.1%
3.0	40	1598.979	---	1 (4F) 3D 14.1%	1 (2F) 1F 8.6%
3.0	41	1613.359	---	1 (4G) 3G 15.0%	1 (4G) 3F 13.9%
3.0	42	1645.062	---	1 (2F) 1F 32.4%	1 (4G) 3G 10.0%
3.0	43	1669.205	---	1 (4F) 3D 17.6%	1 (2F) 1F 16.8%
3.0	44	1672.722	---	1 (4F) 3F 28.2%	1 (2G) 1F 14.8%
3.0	45	1698.597	---	1 (2D) 1F 37.5%	1 (2G) 1F 19.0%
3.0	46	1737.916	---	1 (2G) 1F 33.8%	1 (2D) 1F 20.9%
4.0	1	1025.497	---	1 (6S) 7P 94.0%	1 (4P) 5D 5.3%
4.0	2	1123.683	---	1 (4P) 5D 32.6%	1 (4D) 5F 20.4%
4.0	3	1137.758	---	1 (4G) 5G 56.3%	1 (4G) 5H 9.6%
4.0	4	1173.028	---	1 (4P) 5D 22.0%	1 (4D) 5F 12.9%
4.0	5	1180.818	---	1 (4D) 5F 22.2%	1 (2D) 3F 10.9%
4.0	6	1197.284	---	1 (2F) 3F 14.6%	1 (4G) 3F 12.5%
4.0	7	1215.245	---	1 (4D) 5D 15.8%	1 (4G) 3H 14.1%
4.0	8	1226.458	---	1 (2D) 3F 15.9%	1 (2F) 3F 14.7%
4.0	9	1240.006	---	1 (2F) 3G 13.1%	1 (2H) 3G 11.1%
4.0	10	1258.677	---	1 (4F) 5G 29.6%	1 (4G) 5H 9.1%
4.0	11	1271.580	---	1 (2F) 1G 17.4%	1 (4G) 5H 14.3%
4.0	12	1276.044	---	1 (4G) 5F 13.2%	1 (4D) 5D 12.4%
4.0	13	1278.529	---	1 (2I) 3H 19.2%	1 (2D) 3F 15.1%

ODD PARITY J	NO	ENERGY(KK)		LEADING PERCENTAGES	
4.0	14	1291.137	---	1 (4F) 5F 19.6%	1 (2H) 3H 14.8%
4.0	15	1303.032	---	1 (4D) 5D 20.7%	1 (4F) 3F 8.6%
4.0	16	1313.796	---	1 (2G) 3H 12.1%	1 (4F) 5F 10.6%
4.0	17	1317.633	---	1 (4F) 5G 19.9%	1 (2F) 3G 13.4%
4.0	18	1331.790	---	1 (2G) 3F 13.3%	1 (2H) 3H 8.7%
4.0	19	1343.406	---	1 (4G) 5F 33.4%	1 (4G) 5G 9.3%
4.0	20	1372.324	---	1 (2H) 3G 17.0%	1 (2F) 3G 15.7%
4.0	21	1374.136	---	1 (4F) 5D 27.3%	1 (2D) 3F 10.1%
4.0	22	1400.277	---	1 (2G) 3G 17.0%	1 (2H) 1G 13.3%
4.0	23	1414.448	---	1 (2I) 3H 15.9%	1 (2G) 1G 9.3%
4.0	24	1418.553	---	1 (4F) 5D 17.4%	1 (2G) 3G 14.0%
4.0	25	1428.218	---	1 (2D) 3F 22.7%	1 (2H) 3H 11.1%
4.0	26	1453.790	---	1 (2G) 3G 10.8%	1 (2G) 3H 10.2%
4.0	27	1459.982	---	1 (2G) 3H 18.6%	1 (2G) 1G 17.4%
4.0	28	1468.817	---	1 (2H) 3G 16.2%	1 (2D) 3F 12.6%
4.0	29	1487.744	---	1 (2F) 1G 17.7%	1 (4G) 3F 9.9%
4.0	30	1497.015	---	1 (4F) 3G 31.6%	1 (4G) 3G 10.1%
4.0	31	1525.906	---	1 (2G) 3H 18.0%	1 (2H) 1G 15.6%
4.0	32	1543.671	---	1 (2G) 3G 26.6%	1 (2G) 3H 16.1%
4.0	33	1550.916	---	1 (4G) 3F 17.7%	1 (2G) 1G 11.5%
4.0	34	1593.982	---	1 (4G) 3G 31.9%	1 (2G) 3F 12.2%
4.0	35	1632.547	---	1 (4G) 3G 23.3%	1 (4D) 3F 19.0%
4.0	36	1649.103	---	1 (4F) 3F 28.1%	1 (2H) 1G 15.3%
4.0	37	1679.004	---	1 (2G) 1G 26.7%	1 (2G) 3F 18.6%
5.0	1	1129.093	---	1 (4G) 5G 49.1%	1 (4G) 5H 15.1%
5.0	2	1152.718	---	1 (4D) 5F 64.7%	1 (4G) 5G 17.8%
5.0	3	1192.162	---	1 (4G) 5H 39.2%	1 (4G) 3H 23.4%
5.0	4	1220.947	---	1 (2F) 3G 15.6%	1 (2I) 3I 13.4%
5.0	5	1227.606	---	1 (2G) 3H 30.6%	1 (2G) 1H 11.9%
5.0	6	1248.802	---	1 (4F) 5G 26.3%	1 (2I) 1H 15.6%
5.0	7	1253.839	---	1 (2F) 3G 34.8%	1 (2H) 3H 12.8%
5.0	8	1270.078	---	1 (4F) 5F 18.3%	1 (2G) 3G 13.3%
5.0	9	1274.844	---	1 (2F) 3G 30.9%	1 (4F) 5F 16.4%
5.0	10	1304.166	---	1 (4F) 5G 13.9%	1 (2F) 3G 12.9%
5.0	11	1323.097	---	1 (2G) 3H 19.4%	1 (2G) 3G 15.0%
5.0	12	1337.410	---	1 (4G) 5F 23.8%	1 (2H) 3G 16.2%
5.0	13	1345.899	---	1 (4G) 5F 13.9%	1 (2G) 3H 13.5%
5.0	14	1358.054	---	1 (2G) 3H 27.6%	1 (2G) 3G 12.4%
5.0	15	1377.787	---	1 (4G) 5F 22.4%	1 (2G) 3G 16.8%
5.0	16	1414.334	---	1 (2H) 3I 30.8%	1 (2G) 3G 17.7%
5.0	17	1436.864	---	1 (2G) 3H 17.3%	1 (2G) 1H 16.3%
5.0	18	1467.845	---	1 (2I) 3H 26.1%	1 (2G) 1H 16.3%
5.0	19	1486.594	---	1 (2H) 3G 25.6%	1 (2H) 3H 20.0%
5.0	20	1504.190	---	1 (2H) 1H 22.3%	1 (4F) 3G 13.6%
5.0	21	1553.914	---	1 (4G) 3G 30.0%	1 (4F) 3G 27.0%
5.0	22	1587.808	---	1 (2G) 1H 29.5%	1 (2I) 1H 17.1%
5.0	23	1621.696	---	1 (4G) 3G 43.5%	1 (2H) 3G 21.2%
5.0	24	1656.686	---	1 (2H) 1H 28.5%	1 (2G) 1H 23.2%
6.0	1	1125.109	---	1 (4G) 5G 62.0%	1 (4G) 5H 17.6%

ODD J	PARITY NO	ENERGY(KK)		LEADING PERCENTAGES	
6.0	2	1181.055	---	1 (4G) 5H 61.5%	1 (4G) 3H 19.3%
6.0	3	1203.275	---	1 (2G) 3H 40.5%	1 (2I) 3I 13.9%
6.0	4	1227.019	---	1 (4F) 5G 64.6%	1 (2I) 3I 7.2%
6.0	5	1257.103	---	1 (2I) 3I 25.7%	1 (2G) 3H 24.7%
6.0	6	1286.513	---	1 (2H) 3I 38.9%	1 (2H) 1I 36.6%
6.0	7	1300.562	---	1 (2H) 3H 21.8%	1 (2I) 3I 15.7%
6.0	8	1342.443	---	1 (2G) 3H 29.6%	1 (2G) 3H 21.8%
6.0	9	1360.132	---	1 (2G) 3H 41.9%	1 (2I) 3K 24.7%
6.0	10	1417.148	---	1 (4G) 3H 34.7%	1 (2I) 3H 15.7%
6.0	11	1455.937	---	1 (2H) 1I 22.3%	1 (2H) 3I 17.1%
6.0	12	1501.301	---	1 (2I) 3H 21.8%	1 (4G) 3H 19.8%
6.0	13	1575.320	---	1 (2I) 1I 51.3%	1 (2I) 3H 29.5%
7.0	1	1153.933	---	1 (4G) 5H 92.1%	1 (2H) 3I 6.6%
7.0	2	1212.566	---	1 (2I) 3K 40.3%	1 (2H) 3I 27.4%
7.0	3	1265.311	---	1 (2I) 1K 49.9%	1 (2I) 3I 33.0%
7.0	4	1286.320	---	1 (2H) 3I 62.2%	1 (2I) 3K 20.4%
7.0	5	1420.728	---	1 (2I) 1K 45.7%	1 (2I) 3I 28.8%
8.0	1	1222.283	---	1 (2I) 3K100.0%	



Mo XXI　スペクトル・パターン
$(3d)^4 - (3p)^5\ (3d)^5$

Mo XXI　波長，振動子強度

$(3d)^4 - (3p)^5\ (3d)^5$

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
1	148.200	6.0	1212.566	7.0	93.953	0.0854	0.6455E+11
2	193.931	3.0	1271.580	4.0	92.795	0.0866	0.6710E+11
3	170.293	4.0	1248.801	5.0	92.721	0.0997	0.7736E+11
4	140.212	3.0	1226.458	4.0	92.060	0.1524	0.1199E+12
5	123.756	4.0	1227.606	5.0	90.592	0.2177	0.1769E+12
6	252.027	4.0	1358.054	5.0	90.414	0.1484	0.1211E+12
7	96.821	5.0	1203.275	6.0	90.379	0.1524	0.1244E+12
8	41.037	4.0	1152.717	5.0	89.954	0.1028	0.8475E+11
9	148.200	6.0	1265.311	7.0	89.517	0.1024	0.8521E+11
10	97.267	3.0	1215.244	4.0	89.447	0.1011	0.8427E+11
11	193.931	3.0	1313.796	4.0	89.296	0.1197	0.1002E+12
12	140.212	3.0	1278.529	4.0	87.849	0.1324	0.1144E+12
13	80.010	4.0	1220.947	5.0	87.647	0.3639	0.3159E+12
14	97.267	3.0	1240.006	4.0	87.509	0.1300	0.1133E+12
15	32.094	3.0	1180.817	4.0	87.053	0.0841	0.7401E+11
16	128.882	3.0	1278.529	4.0	86.983	0.0939	0.8276E+11
17	170.293	4.0	1323.097	5.0	86.745	0.1816	0.1609E+12
18	96.821	5.0	1257.103	6.0	86.186	0.3266	0.2933E+12
19	104.843	6.0	1265.311	7.0	86.172	0.7703	0.6919E+12
20	114.225	4.0	1274.844	5.0	86.161	0.1954	0.1756E+12
21	182.887	2.0	1349.466	2.0	85.721	0.0814	0.7391E+11
22	123.756	4.0	1291.137	4.0	85.662	0.0812	0.7382E+11
23	80.010	4.0	1248.801	5.0	85.559	0.2850	0.2597E+12
24	96.821	5.0	1270.078	5.0	85.233	0.0944	0.8664E+11
25	101.506	2.0	1279.807	3.0	84.868	0.1062	0.9838E+11
26	97.267	3.0	1278.529	4.0	84.655	0.1518	0.1412E+12
27	104.843	6.0	1286.319	7.0	84.640	0.6672	0.6212E+12
28	139.509	5.0	1323.097	5.0	84.489	0.1746	0.1631E+12
29	128.882	3.0	1313.796	4.0	84.394	0.0982	0.9199E+11
30	128.882	3.0	1317.633	4.0	84.122	0.1804	0.1701E+12
31	80.010	4.0	1270.078	5.0	84.029	0.1462	0.1381E+12
32	147.292	2.0	1339.972	3.0	83.845	0.1006	0.9543E+11
33	97.267	3.0	1291.137	4.0	83.761	0.1415	0.1345E+12
34	220.438	4.0	1414.333	5.0	83.759	0.1429	0.1358E+12
35	220.438	4.0	1414.447	4.0	83.751	0.1871	0.1779E+12
36	148.200	6.0	1342.443	6.0	83.735	0.1224	0.1164E+12
37	104.843	6.0	1300.562	6.0	83.632	0.6210	0.5922E+12
38	21.736	2.0	1217.679	3.0	83.616	0.1460	0.1393E+12
39	139.509	5.0	1337.409	5.0	83.479	0.0981	0.9389E+11
40	123.982	2.0	1322.012	3.0	83.470	0.0855	0.8185E+11
41	220.438	4.0	1418.553	4.0	83.464	0.2003	0.1918E+12
42	104.843	6.0	1304.166	5.0	83.380	0.1511	0.1450E+12
43	114.225	4.0	1313.796	4.0	83.363	0.2788	0.2675E+12
44	176.117	0.0	1376.208	1.0	83.327	0.0828	0.7951E+11
45	170.293	4.0	1372.323	4.0	83.193	0.2200	0.2120E+12
46	214.468	2.0	1417.056	2.0	83.154	0.0822	0.7924E+11
47	139.509	5.0	1342.443	6.0	83.130	0.5923	0.5717E+12
48	96.821	5.0	1300.562	6.0	83.074	0.3569	0.3449E+12
49	10.449	1.0	1214.449	2.0	83.057	0.1149	0.1111E+12
50	182.887	2.0	1389.752	3.0	82.859	0.1004	0.9751E+11

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
51	96.821	5.0	1304.166	5.0	82.826	0.1917	0.1864E+12
52	32.094	3.0	1240.006	4.0	82.787	0.0886	0.8626E+11
53	148.200	6.0	1360.132	6.0	82.513	0.2362	0.2314E+12
54	101.506	2.0	1313.477	3.0	82.510	0.1271	0.1245E+12
55	123.982	2.0	1336.256	2.0	82.490	0.0847	0.8304E+11
56	0.000	0.0	1214.651	1.0	82.328	0.1583	0.1558E+12
57	214.468	2.0	1429.248	2.0	82.319	0.2242	0.2206E+12
58	252.027	4.0	1467.844	5.0	82.249	0.1531	0.1509E+12
59	99.152	1.0	1315.066	2.0	82.243	0.1269	0.1251E+12
60	97.267	3.0	1313.477	3.0	82.223	0.1353	0.1335E+12
61	220.438	4.0	1436.863	5.0	82.208	0.3359	0.3315E+12
62	97.267	3.0	1313.796	4.0	82.201	0.1133	0.1119E+12
63	182.887	2.0	1400.861	3.0	82.104	0.0863	0.8543E+11
64	139.509	5.0	1358.054	5.0	82.065	0.4035	0.3997E+12
65	123.756	4.0	1343.406	4.0	81.991	0.2654	0.2634E+12
66	97.267	3.0	1317.633	4.0	81.943	0.1522	0.1512E+12
67	123.756	4.0	1345.898	5.0	81.824	0.5484	0.5463E+12
68	32.094	3.0	1255.446	3.0	81.743	0.1185	0.1183E+12
69	80.010	4.0	1304.166	5.0	81.689	0.1099	0.1098E+12
70	97.267	3.0	1322.012	3.0	81.650	0.0857	0.8573E+11
71	21.736	2.0	1247.232	1.0	81.600	0.0872	0.8731E+11
72	123.982	2.0	1349.602	3.0	81.591	0.1330	0.1333E+12
73	96.821	5.0	1323.097	5.0	81.548	0.1249	0.1253E+12
74	214.468	2.0	1440.807	2.0	81.544	0.1161	0.1164E+12
75	154.459	1.0	1381.753	2.0	81.480	0.1586	0.1593E+12
76	232.277	3.0	1459.981	4.0	81.453	0.2669	0.2683E+12
77	41.037	4.0	1270.078	5.0	81.364	0.9283	0.9352E+12
78	148.200	6.0	1377.786	5.0	81.328	0.1062	0.1071E+12
79	123.982	2.0	1353.832	2.0	81.311	0.0813	0.8200E+11
80	73.746	0.0	1303.666	1.0	81.306	0.2346	0.2367E+12
81	114.225	4.0	1345.898	5.0	81.190	0.1215	0.1229E+12
82	21.736	2.0	1255.661	2.0	81.042	0.2398	0.2436E+12
83	139.509	5.0	1374.136	4.0	80.996	0.2132	0.2168E+12
84	41.037	4.0	1276.043	4.0	80.971	0.4551	0.4629E+12
85	252.027	4.0	1487.744	4.0	80.925	0.1333	0.1357E+12
86	232.277	3.0	1468.817	4.0	80.871	0.2029	0.2069E+12
87	101.506	2.0	1338.208	3.0	80.860	0.0948	0.9673E+11
88	10.449	1.0	1247.232	1.0	80.855	0.1739	0.1774E+12
89	140.212	3.0	1377.051	3.0	80.851	0.2446	0.2495E+12
90	104.843	6.0	1342.443	6.0	80.802	0.1413	0.1444E+12
91	99.152	1.0	1336.802	1.0	80.798	0.0979	0.1000E+12
92	96.821	5.0	1337.409	5.0	80.607	0.1683	0.1728E+12
93	104.843	6.0	1345.898	5.0	80.577	0.1494	0.1535E+12
94	176.117	0.0	1417.662	1.0	80.545	0.1057	0.1087E+12
95	99.152	1.0	1342.425	2.0	80.433	0.2678	0.2761E+12
96	182.887	2.0	1426.152	3.0	80.433	0.1590	0.1639E+12
97	114.225	4.0	1358.054	5.0	80.397	0.1742	0.1798E+12
98	32.094	3.0	1276.043	4.0	80.389	0.2503	0.2583E+12
99	21.736	2.0	1265.712	3.0	80.387	0.1280	0.1322E+12
100	32.094	3.0	1276.750	3.0	80.343	0.2125	0.2196E+12

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
101	232.277	3.0	1477.270	3.0	80.322	0.1057	0.1093E+12
102	10.449	1.0	1255.661	2.0	80.308	0.1873	0.1937E+12
103	96.821	5.0	1342.443	6.0	80.281	0.2970	0.3074E+12
104	97.267	3.0	1343.406	4.0	80.248	0.2410	0.2496E+12
105	182.887	2.0	1429.248	2.0	80.234	0.0937	0.9706E+11
106	220.438	4.0	1467.844	5.0	80.166	0.0945	0.9806E+11
107	32.094	3.0	1279.807	3.0	80.147	0.1170	0.1215E+12
108	101.506	2.0	1349.602	3.0	80.122	0.5454	0.5666E+12
109	228.968	2.0	1477.270	3.0	80.109	0.1253	0.1302E+12
110	41.037	4.0	1291.137	4.0	79.994	0.5118	0.5334E+12
111	252.027	4.0	1504.189	5.0	79.862	0.4883	0.5106E+12
112	97.267	3.0	1349.602	3.0	79.851	0.2257	0.2361E+12
113	101.506	2.0	1354.499	3.0	79.809	0.0963	0.1008E+12
114	123.982	2.0	1377.051	3.0	79.804	0.3058	0.3202E+12
115	123.756	4.0	1377.786	5.0	79.743	0.1429	0.1499E+12
116	21.736	2.0	1276.750	3.0	79.680	0.1478	0.1553E+12
117	0.000	0.0	1258.667	1.0	79.449	0.1868	0.1974E+12
118	32.094	3.0	1291.137	4.0	79.425	0.2094	0.2214E+12
119	21.736	2.0	1281.072	1.0	79.407	0.1085	0.1148E+12
120	193.931	3.0	1453.790	4.0	79.374	0.0958	0.1014E+12
121	140.212	3.0	1400.276	4.0	79.361	0.3667	0.3884E+12
122	237.602	1.0	1497.987	1.0	79.341	0.1570	0.1664E+12
123	32.094	3.0	1292.495	2.0	79.340	0.1748	0.1852E+12
124	147.292	2.0	1407.687	3.0	79.340	0.3721	0.3943E+12
125	96.821	5.0	1358.054	5.0	79.288	0.2069	0.2196E+12
126	41.037	4.0	1303.032	4.0	79.240	0.4958	0.5267E+12
127	114.225	4.0	1377.051	3.0	79.188	0.0883	0.9390E+11
128	96.821	5.0	1360.132	6.0	79.157	0.2828	0.3011E+12
129	114.225	4.0	1377.786	5.0	79.141	0.6409	0.6825E+12
130	123.982	2.0	1388.380	2.0	79.089	0.1198	0.1278E+12
131	232.277	3.0	1497.015	4.0	79.068	0.1135	0.1211E+12
132	248.962	0.0	1514.744	1.0	79.003	0.0929	0.9926E+11
133	80.010	4.0	1345.898	5.0	78.996	0.2130	0.2276E+12
134	193.931	3.0	1459.981	4.0	78.986	0.1970	0.2106E+12
135	148.200	6.0	1414.333	5.0	78.981	0.2078	0.2222E+12
136	220.438	4.0	1486.593	5.0	78.979	0.3506	0.3749E+12
137	170.293	4.0	1436.863	5.0	78.953	0.0895	0.9578E+11
138	32.094	3.0	1299.636	3.0	78.893	0.1425	0.1528E+12
139	147.292	2.0	1415.217	3.0	78.869	0.1112	0.1192E+12
140	214.468	2.0	1482.418	1.0	78.867	0.0895	0.9592E+11
141	148.200	6.0	1417.148	6.0	78.805	0.2923	0.3139E+12
142	147.292	2.0	1417.662	1.0	78.717	0.1155	0.1243E+12
143	10.449	1.0	1281.072	1.0	78.702	0.1667	0.1795E+12
144	21.736	2.0	1292.495	2.0	78.693	0.3617	0.3896E+12
145	32.094	3.0	1303.032	4.0	78.682	0.5152	0.5551E+12
146	148.200	6.0	1420.728	7.0	78.584	0.8803	0.9507E+12
147	320.377	2.0	1592.976	2.0	78.579	0.1119	0.1209E+12
148	252.027	4.0	1525.906	4.0	78.500	0.0800	0.8655E+11
149	140.212	3.0	1414.447	4.0	78.479	0.1357	0.1470E+12
150	139.509	5.0	1414.333	5.0	78.442	0.0872	0.9448E+11

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
151	10.449	1.0	1285.325	2.0	78.439	0.1968	0.2134E+12
152	193.931	3.0	1468.817	4.0	78.438	0.2778	0.3011E+12
153	97.267	3.0	1372.323	4.0	78.428	0.2298	0.2492E+12
154	101.506	2.0	1377.051	3.0	78.398	0.0860	0.9330E+11
155	41.037	4.0	1317.633	4.0	78.333	0.0926	0.1007E+12
156	139.509	5.0	1417.148	6.0	78.269	0.9875	0.1075E+13
157	21.736	2.0	1299.636	3.0	78.253	0.4018	0.4376E+12
158	80.010	4.0	1358.054	5.0	78.245	0.1164	0.1268E+12
159	140.212	3.0	1418.553	4.0	78.226	0.1033	0.1126E+12
160	147.292	2.0	1426.152	3.0	78.195	0.4944	0.5394E+12
161	41.037	4.0	1322.012	3.0	78.066	0.2041	0.2234E+12
162	32.094	3.0	1313.477	3.0	78.041	0.2142	0.2346E+12
163	41.037	4.0	1323.097	5.0	77.999	0.0892	0.9781E+11
164	170.293	4.0	1453.790	4.0	77.912	0.1860	0.2044E+12
165	237.602	1.0	1521.242	2.0	77.904	0.1753	0.1927E+12
166	237.602	1.0	1522.907	0.0	77.803	0.1324	0.1459E+12
167	128.882	3.0	1414.447	4.0	77.787	0.3191	0.3518E+12
168	237.602	1.0	1523.214	2.0	77.784	0.1073	0.1182E+12
169	140.212	3.0	1426.152	3.0	77.764	0.0965	0.1064E+12
170	220.438	4.0	1507.716	3.0	77.683	0.1183	0.1307E+12
171	140.212	3.0	1428.218	4.0	77.639	0.1019	0.1128E+12
172	99.152	1.0	1388.380	2.0	77.566	0.2538	0.2814E+12
173	170.293	4.0	1459.981	4.0	77.538	0.1527	0.1694E+12
174	32.094	3.0	1322.012	3.0	77.524	0.4507	0.5002E+12
175	147.292	2.0	1437.706	1.0	77.495	0.0856	0.9508E+11
176	123.756	4.0	1414.333	5.0	77.485	0.5134	0.5703E+12
177	232.277	3.0	1523.214	2.0	77.463	0.1364	0.1516E+12
178	252.027	4.0	1543.670	4.0	77.421	0.1560	0.1736E+12
179	80.010	4.0	1372.323	4.0	77.381	0.0980	0.1092E+12
180	214.468	2.0	1507.716	3.0	77.325	0.3325	0.3709E+12
181	147.292	2.0	1440.807	2.0	77.309	0.1118	0.1248E+12
182	80.010	4.0	1374.136	4.0	77.272	0.1495	0.1670E+12
183	182.887	2.0	1477.270	3.0	77.257	0.1127	0.1260E+12
184	41.037	4.0	1337.409	5.0	77.138	1.2083	0.1354E+13
185	128.882	3.0	1426.152	3.0	77.085	0.1445	0.1622E+12
186	139.509	5.0	1436.863	5.0	77.080	0.5011	0.5625E+12
187	99.152	1.0	1397.654	1.0	77.012	0.1748	0.1966E+12
188	170.293	4.0	1468.817	4.0	77.011	0.1175	0.1321E+12
189	114.225	4.0	1414.447	4.0	76.910	0.1798	0.2028E+12
190	10.449	1.0	1310.730	0.0	76.907	0.1224	0.1380E+12
191	21.736	2.0	1322.012	3.0	76.907	0.0938	0.1058E+12
192	140.212	3.0	1440.807	2.0	76.888	0.2136	0.2410E+12
193	193.931	3.0	1495.557	2.0	76.827	0.1278	0.1444E+12
194	73.746	0.0	1376.208	1.0	76.778	0.2366	0.2677E+12
195	140.212	3.0	1442.950	3.0	76.761	0.1082	0.1225E+12
196	0.000	0.0	1303.666	1.0	76.707	0.1783	0.2022E+12
197	32.094	3.0	1336.256	2.0	76.678	0.2471	0.2804E+12
198	123.756	4.0	1428.218	4.0	76.660	0.1492	0.1694E+12
199	10.449	1.0	1315.066	2.0	76.651	0.1174	0.1333E+12
200	228.968	2.0	1533.772	3.0	76.640	0.1062	0.1206E+12

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
201	41.037	4.0	1345.898	5.0	76.637	0.2442	0.2773E+12
202	220.438	4.0	1525.906	4.0	76.601	0.0942	0.1071E+12
203	101.506	2.0	1407.687	3.0	76.559	0.1006	0.1144E+12
204	176.117	0.0	1482.418	1.0	76.552	0.1656	0.1885E+12
205	140.212	3.0	1446.596	2.0	76.547	0.2101	0.2392E+12
206	104.843	6.0	1414.333	5.0	76.366	0.0954	0.1091E+12
207	97.267	3.0	1407.687	3.0	76.311	0.1418	0.1624E+12
208	248.962	0.0	1560.052	1.0	76.272	0.1143	0.1311E+12
209	32.094	3.0	1343.406	4.0	76.259	1.0308	0.1182E+13
210	232.277	3.0	1543.670	4.0	76.255	0.3790	0.4348E+12
211	104.843	6.0	1417.148	6.0	76.202	0.3962	0.4551E+12
212	214.468	2.0	1527.114	3.0	76.182	0.1511	0.1737E+12
213	123.756	4.0	1436.863	5.0	76.155	0.1863	0.2143E+12
214	41.037	4.0	1354.499	3.0	76.135	0.1548	0.1781E+12
215	140.212	3.0	1453.790	4.0	76.128	0.1991	0.2291E+12
216	123.982	2.0	1437.706	1.0	76.120	0.1078	0.1241E+12
217	139.509	5.0	1453.790	4.0	76.087	0.1452	0.1672E+12
218	21.736	2.0	1336.802	1.0	76.042	0.1500	0.1730E+12
219	101.506	2.0	1417.056	2.0	76.014	0.1845	0.2130E+12
220	104.843	6.0	1420.728	7.0	75.995	0.1691	0.1953E+12
221	139.509	5.0	1455.937	6.0	75.963	0.1791	0.2070E+12
222	21.736	2.0	1338.208	3.0	75.961	0.4702	0.5435E+12
223	41.037	4.0	1358.054	5.0	75.929	0.2514	0.2909E+12
224	99.152	1.0	1417.056	2.0	75.878	0.2649	0.3069E+12
225	232.277	3.0	1550.915	4.0	75.836	0.1875	0.2175E+12
226	214.468	2.0	1533.772	3.0	75.798	0.1315	0.1526E+12
227	80.010	4.0	1400.276	4.0	75.742	1.2226	0.1421E+13
228	32.094	3.0	1354.499	3.0	75.620	0.2350	0.2741E+12
229	114.225	4.0	1436.863	5.0	75.607	0.0894	0.1044E+12
230	128.882	3.0	1453.790	4.0	75.477	0.1390	0.1628E+12
231	10.449	1.0	1336.256	2.0	75.426	0.4041	0.4737E+12
232	21.736	2.0	1349.602	3.0	75.309	0.1626	0.1913E+12
233	154.459	1.0	1482.418	1.0	75.304	0.3906	0.4595E+12
234	97.267	3.0	1426.152	3.0	75.251	0.1569	0.1849E+12
235	123.756	4.0	1453.790	4.0	75.186	0.3205	0.3782E+12
236	220.438	4.0	1550.915	4.0	75.161	0.2723	0.3214E+12
237	128.882	3.0	1459.981	4.0	75.126	0.0947	0.1119E+12
238	123.982	2.0	1455.798	2.0	75.085	0.3745	0.4430E+12
239	193.931	3.0	1525.906	4.0	75.076	0.3407	0.4032E+12
240	228.968	2.0	1561.252	3.0	75.059	0.0881	0.1043E+12
241	41.037	4.0	1374.136	4.0	75.013	0.8862	0.1050E+13
242	320.377	2.0	1653.756	2.0	74.997	0.1716	0.2034E+12
243	220.438	4.0	1553.914	5.0	74.992	0.2064	0.2448E+12
244	170.293	4.0	1504.189	5.0	74.968	0.4883	0.5795E+12
245	123.982	2.0	1457.905	1.0	74.967	0.1867	0.2215E+12
246	80.010	4.0	1414.447	4.0	74.938	0.3151	0.3742E+12
247	10.449	1.0	1345.680	0.0	74.893	0.0801	0.9524E+11
248	252.027	4.0	1587.808	5.0	74.863	0.5471	0.6511E+12
249	101.506	2.0	1437.706	1.0	74.839	0.4393	0.5231E+12
250	41.037	4.0	1377.786	5.0	74.808	0.2804	0.3342E+12

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
251	140.212	3.0	1477.270	3.0	74.791	0.1012	0.1206E+12
252	182.887	2.0	1520.886	3.0	74.739	0.2439	0.2913E+12
253	80.010	4.0	1418.553	4.0	74.708	1.4370	0.1717E+13
254	101.506	2.0	1440.807	2.0	74.666	0.1988	0.2378E+12
255	114.225	4.0	1453.790	4.0	74.651	0.9639	0.1154E+13
256	193.931	3.0	1533.772	3.0	74.636	0.0948	0.1135E+12
257	128.882	3.0	1468.817	4.0	74.630	0.4515	0.5407E+12
258	96.821	5.0	1436.863	5.0	74.625	0.6955	0.8330E+12
259	220.438	4.0	1561.252	3.0	74.582	0.1972	0.2364E+12
260	154.459	1.0	1495.557	2.0	74.566	0.1053	0.1263E+12
261	320.377	2.0	1661.621	2.0	74.558	0.2317	0.2780E+12
262	101.506	2.0	1442.950	3.0	74.547	0.2412	0.2895E+12
263	99.152	1.0	1440.807	2.0	74.535	0.1850	0.2222E+12
264	97.267	3.0	1440.807	2.0	74.430	0.2341	0.2819E+12
265	73.746	0.0	1417.662	1.0	74.409	0.0887	0.1069E+12
266	182.887	2.0	1527.114	3.0	74.392	0.3631	0.4376E+12
267	101.506	2.0	1446.596	2.0	74.345	0.1311	0.1582E+12
268	97.267	3.0	1442.950	3.0	74.312	0.9989	0.1206E+13
269	139.509	5.0	1486.593	5.0	74.234	0.0989	0.1197E+12
270	232.277	3.0	1579.543	3.0	74.224	0.1496	0.1811E+12
271	80.010	4.0	1428.218	4.0	74.173	0.4637	0.5621E+12
272	139.509	5.0	1487.744	4.0	74.171	0.1671	0.2026E+12
273	147.292	2.0	1495.557	2.0	74.169	0.2810	0.3407E+12
274	97.267	3.0	1446.596	2.0	74.111	0.1725	0.2094E+12
275	405.231	0.0	1754.805	1.0	74.098	0.2406	0.2923E+12
276	193.931	3.0	1543.670	4.0	74.088	0.1667	0.2026E+12
277	123.982	2.0	1475.887	2.0	73.970	0.1033	0.1260E+12
278	193.931	3.0	1546.890	2.0	73.912	0.1190	0.1453E+12
279	148.200	6.0	1501.301	6.0	73.904	0.3540	0.4323E+12
280	123.982	2.0	1477.270	3.0	73.894	0.7246	0.8851E+12
281	248.962	0.0	1602.602	1.0	73.875	0.0925	0.1130E+12
282	193.931	3.0	1547.989	2.0	73.852	0.3818	0.4669E+12
283	101.506	2.0	1455.798	2.0	73.839	0.1158	0.1416E+12
284	140.212	3.0	1495.557	2.0	73.782	0.2911	0.3566E+12
285	237.602	1.0	1592.976	2.0	73.780	0.0945	0.1158E+12
286	80.010	4.0	1436.863	5.0	73.700	0.1154	0.1417E+12
287	193.931	3.0	1550.915	4.0	73.693	0.1043	0.1281E+12
288	140.212	3.0	1497.694	3.0	73.666	0.6454	0.7933E+12
289	99.152	1.0	1457.013	0.0	73.645	0.4123	0.5070E+12
290	123.982	2.0	1482.418	1.0	73.614	0.1043	0.1284E+12
291	99.152	1.0	1457.905	1.0	73.597	0.2920	0.3595E+12
292	128.882	3.0	1487.744	4.0	73.591	0.3201	0.3942E+12
293	220.438	4.0	1579.543	3.0	73.578	0.0838	0.1032E+12
294	41.037	4.0	1400.276	4.0	73.571	0.0881	0.1085E+12
295	147.292	2.0	1507.716	3.0	73.506	0.1166	0.1440E+12
296	320.377	2.0	1680.923	2.0	73.500	0.7016	0.8663E+12
297	232.277	3.0	1593.982	4.0	73.437	0.0963	0.1191E+12
298	139.509	5.0	1501.301	6.0	73.433	0.2593	0.3207E+12
299	123.756	4.0	1486.593	5.0	73.376	0.2063	0.2556E+12
300	80.010	4.0	1442.950	3.0	73.371	0.3354	0.4156E+12

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
301	73.746	0.0	1437.706	1.0	73.316	0.1028	0.1275E+12
302	123.756	4.0	1487.744	4.0	73.314	0.9668	0.1200E+13
303	139.509	5.0	1504.189	5.0	73.277	0.6513	0.8091E+12
304	182.887	2.0	1547.989	2.0	73.255	0.3088	0.3838E+12
305	228.968	2.0	1594.478	3.0	73.233	0.1096	0.1363E+12
306	232.277	3.0	1598.979	3.0	73.169	0.1735	0.2161E+12
307	220.438	4.0	1587.808	5.0	73.133	0.0932	0.1162E+12
308	147.292	2.0	1514.744	1.0	73.129	0.0828	0.1033E+12
309	237.602	1.0	1605.244	2.0	73.119	0.1161	0.1449E+12
310	32.094	3.0	1400.861	3.0	73.058	0.0966	0.1207E+12
311	128.882	3.0	1497.694	3.0	73.056	0.3326	0.4156E+12
312	228.968	2.0	1598.979	3.0	72.992	0.6166	0.7720E+12
313	123.756	4.0	1494.279	3.0	72.965	0.0832	0.1043E+12
314	214.468	2.0	1585.268	2.0	72.950	0.2984	0.3739E+12
315	96.821	5.0	1467.844	5.0	72.938	1.3311	0.1669E+13
316	123.982	2.0	1495.557	2.0	72.909	0.2162	0.2713E+12
317	114.225	4.0	1486.593	5.0	72.867	0.1779	0.2235E+12
318	123.756	4.0	1497.015	4.0	72.819	0.4927	0.6197E+12
319	170.293	4.0	1543.670	4.0	72.813	0.1740	0.2189E+12
320	41.037	4.0	1414.447	4.0	72.811	0.0812	0.1021E+12
321	114.225	4.0	1487.744	4.0	72.806	0.1154	0.1452E+12
322	220.438	4.0	1593.982	4.0	72.804	0.4428	0.5572E+12
323	228.968	2.0	1602.602	1.0	72.800	0.2135	0.2687E+12
324	80.010	4.0	1453.790	4.0	72.792	0.3117	0.3924E+12
325	101.506	2.0	1475.887	2.0	72.760	0.3395	0.4277E+12
326	320.377	2.0	1696.256	2.0	72.681	0.1611	0.2034E+12
327	147.292	2.0	1523.214	2.0	72.679	0.1218	0.1538E+12
328	101.506	2.0	1477.429	2.0	72.679	0.1181	0.1492E+12
329	21.736	2.0	1397.654	1.0	72.679	0.3182	0.4018E+12
330	154.459	1.0	1530.699	1.0	72.662	0.2437	0.3079E+12
331	228.968	2.0	1605.244	2.0	72.660	0.2995	0.3784E+12
332	182.887	2.0	1559.242	2.0	72.656	0.1516	0.1915E+12
333	99.152	1.0	1475.887	2.0	72.636	0.0931	0.1177E+12
334	182.887	2.0	1560.052	1.0	72.613	0.1159	0.1466E+12
335	41.037	4.0	1418.553	4.0	72.594	0.1327	0.1679E+12
336	320.377	2.0	1698.596	3.0	72.557	0.8897	0.1127E+13
337	99.152	1.0	1477.429	2.0	72.554	0.1044	0.1323E+12
338	182.887	2.0	1561.252	3.0	72.550	0.0828	0.1050E+12
339	214.468	2.0	1592.976	2.0	72.542	0.0910	0.1153E+12
340	220.438	4.0	1598.979	3.0	72.540	0.1252	0.1586E+12
341	97.267	3.0	1475.887	2.0	72.536	0.1231	0.1560E+12
342	128.882	3.0	1507.716	3.0	72.525	0.6363	0.8068E+12
343	21.736	2.0	1400.861	3.0	72.510	0.1342	0.1702E+12
344	80.010	4.0	1459.981	4.0	72.465	0.1290	0.1638E+12
345	214.468	2.0	1594.478	3.0	72.463	0.2663	0.3382E+12
346	170.293	4.0	1550.915	4.0	72.431	1.0940	0.1391E+13
347	140.212	3.0	1520.886	3.0	72.428	0.2499	0.3177E+12
348	140.212	3.0	1521.242	2.0	72.410	0.1341	0.1706E+12
349	232.277	3.0	1613.358	3.0	72.407	0.4110	0.5228E+12
350	104.843	6.0	1486.593	5.0	72.372	0.5596	0.7126E+12

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
351	114.225	4.0	1497.015	4.0	72.318	1.2449	0.1588E+13
352	114.225	4.0	1497.694	3.0	72.282	0.1993	0.2545E+12
353	170.293	4.0	1553.914	5.0	72.274	0.5268	0.6726E+12
354	73.746	0.0	1457.905	1.0	72.246	0.2833	0.3620E+12
355	214.468	2.0	1598.979	3.0	72.228	0.1584	0.2025E+12
356	193.931	3.0	1579.543	3.0	72.170	0.4641	0.5943E+12
357	32.094	3.0	1418.553	4.0	72.126	0.2291	0.2938E+12
358	140.212	3.0	1527.114	3.0	72.103	0.1341	0.1720E+12
359	10.449	1.0	1397.654	1.0	72.087	0.2382	0.3057E+12
360	214.468	2.0	1602.602	1.0	72.039	0.1005	0.1292E+12
361	96.821	5.0	1486.593	5.0	71.954	2.1436	0.2761E+13
362	114.225	4.0	1504.189	5.0	71.944	0.0964	0.1243E+12
363	214.468	2.0	1605.244	2.0	71.902	0.2455	0.3167E+12
364	96.821	5.0	1487.744	4.0	71.895	0.4246	0.5479E+12
365	170.293	4.0	1561.252	3.0	71.893	0.2454	0.3167E+12
366	21.736	2.0	1413.861	1.0	71.833	0.1892	0.2445E+12
367	128.882	3.0	1521.242	2.0	71.820	0.1322	0.1709E+12
368	237.602	1.0	1630.731	1.0	71.781	0.6284	0.8135E+12
369	114.225	4.0	1507.716	3.0	71.762	0.1058	0.1370E+12
370	154.459	1.0	1547.989	2.0	71.760	0.5612	0.7268E+12
371	140.212	3.0	1533.772	3.0	71.759	0.0911	0.1180E+12
372	41.037	4.0	1436.863	5.0	71.642	0.0881	0.1145E+12
373	21.736	2.0	1417.662	1.0	71.637	0.1819	0.2364E+12
374	104.843	6.0	1501.301	6.0	71.610	5.4167	0.7045E+13
375	101.506	2.0	1497.987	1.0	71.609	0.1055	0.1372E+12
376	252.027	4.0	1649.102	4.0	71.578	0.4300	0.5597E+12
377	123.756	4.0	1520.886	3.0	71.575	0.8416	0.1096E+13
378	123.982	2.0	1521.242	2.0	71.569	0.1048	0.1365E+12
379	0.000	0.0	1397.654	1.0	71.549	0.1166	0.1520E+12
380	128.882	3.0	1527.114	3.0	71.519	0.0960	0.1251E+12
381	214.468	2.0	1613.358	3.0	71.485	0.2648	0.3457E+12
382	147.292	2.0	1546.890	2.0	71.449	0.4188	0.5472E+12
383	97.267	3.0	1497.015	4.0	71.441	0.3273	0.4277E+12
384	232.277	3.0	1632.547	4.0	71.415	0.1048	0.1371E+12
385	193.931	3.0	1594.478	3.0	71.401	0.5757	0.7532E+12
386	220.438	4.0	1621.695	5.0	71.364	0.9058	0.1186E+13
387	123.756	4.0	1525.906	4.0	71.319	0.2231	0.2926E+12
388	182.887	2.0	1585.268	2.0	71.307	0.9410	0.1234E+13
389	123.756	4.0	1527.114	3.0	71.258	0.2664	0.3499E+12
390	10.449	1.0	1413.861	1.0	71.255	0.2153	0.2828E+12
391	139.509	5.0	1543.670	4.0	71.217	0.1403	0.1845E+12
392	96.821	5.0	1501.301	6.0	71.201	0.2154	0.2833E+12
393	252.027	4.0	1656.685	5.0	71.192	0.5403	0.7111E+12
394	154.459	1.0	1559.242	2.0	71.185	0.1201	0.1581E+12
395	128.882	3.0	1533.772	3.0	71.180	0.4807	0.6328E+12
396	193.931	3.0	1598.979	3.0	71.172	0.3515	0.4628E+12
397	154.459	1.0	1560.052	1.0	71.144	0.3875	0.5106E+12
398	123.982	2.0	1530.699	1.0	71.088	0.4111	0.5426E+12
399	10.449	1.0	1417.662	1.0	71.062	0.1881	0.2485E+12
400	96.821	5.0	1504.189	5.0	71.055	0.1097	0.1449E+12

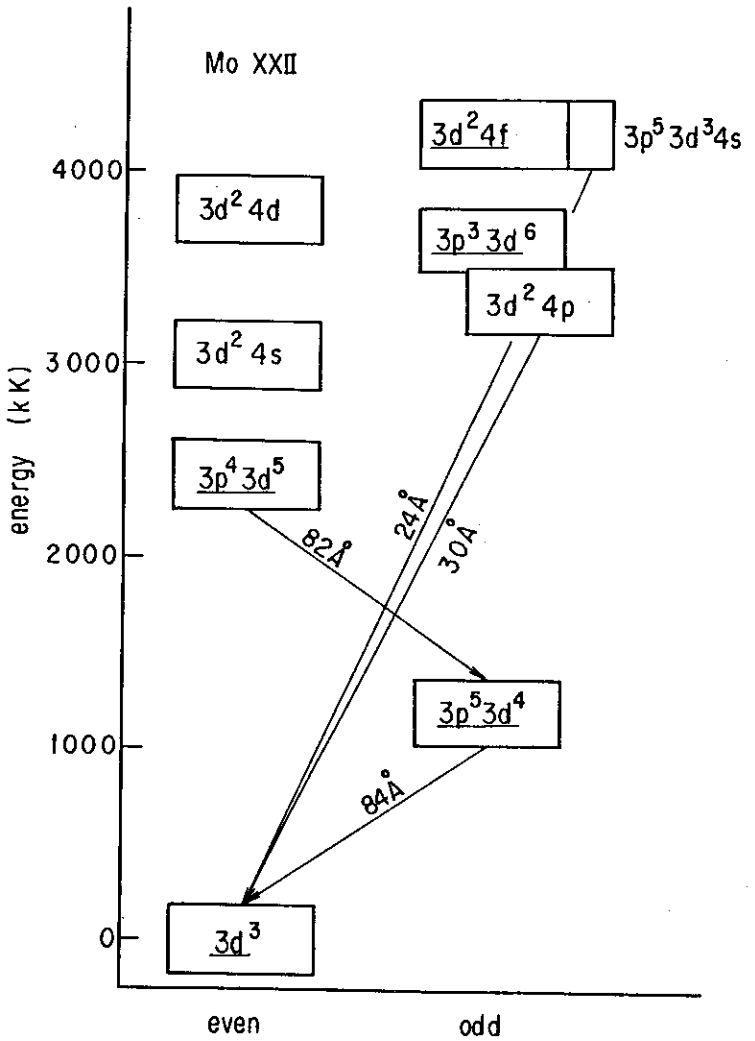
NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
401	170.293	4.0	1579.543	3.0	70.960	0.1312	0.1738E+12
402	123.982	2.0	1533.772	3.0	70.933	0.2029	0.2690E+12
403	182.887	2.0	1592.976	2.0	70.918	0.5084	0.6743E+12
404	97.267	3.0	1507.716	3.0	70.899	0.0808	0.1072E+12
405	140.212	3.0	1550.915	4.0	70.887	0.7198	0.9554E+12
406	405.231	0.0	1816.465	1.0	70.860	0.8934	0.1187E+13
407	193.931	3.0	1605.244	2.0	70.856	0.1211	0.1609E+12
408	182.887	2.0	1594.478	3.0	70.842	0.3110	0.4133E+12
409	147.292	2.0	1559.242	2.0	70.824	0.7924	0.1054E+13
410	220.438	4.0	1632.547	4.0	70.816	0.2584	0.3437E+12
411	237.602	1.0	1650.354	1.0	70.784	0.0992	0.1321E+12
412	147.292	2.0	1560.052	1.0	70.783	0.1003	0.1335E+12
413	101.506	2.0	1514.744	1.0	70.760	0.1070	0.1425E+12
414	0.000	0.0	1413.861	1.0	70.728	0.1369	0.1826E+12
415	147.292	2.0	1561.252	3.0	70.723	0.2514	0.3352E+12
416	139.509	5.0	1553.914	5.0	70.701	1.6136	0.2153E+13
417	237.602	1.0	1653.756	2.0	70.614	0.3019	0.4038E+12
418	170.293	4.0	1587.808	5.0	70.546	0.7965	0.1067E+13
419	320.377	2.0	1737.915	3.0	70.545	1.1428	0.1532E+13
420	128.882	3.0	1546.890	2.0	70.521	0.8057	0.1081E+13
421	140.212	3.0	1559.242	2.0	70.471	0.1512	0.2030E+12
422	128.882	3.0	1547.989	2.0	70.467	1.0465	0.1406E+13
423	193.931	3.0	1613.358	3.0	70.451	0.2941	0.3952E+12
424	114.225	4.0	1533.772	3.0	70.445	0.1650	0.2218E+12
425	101.506	2.0	1521.242	2.0	70.436	0.2188	0.2942E+12
426	140.212	3.0	1561.252	3.0	70.371	0.1305	0.1758E+12
427	21.736	2.0	1442.950	3.0	70.362	0.0809	0.1089E+12
428	123.982	2.0	1546.890	2.0	70.279	0.2241	0.3027E+12
429	170.293	4.0	1593.982	4.0	70.240	1.4417	0.1949E+13
430	32.094	3.0	1455.798	2.0	70.239	0.2665	0.3604E+12
431	237.602	1.0	1661.621	2.0	70.224	0.0881	0.1192E+12
432	228.968	2.0	1653.756	2.0	70.186	0.4374	0.5922E+12
433	252.027	4.0	1679.003	4.0	70.078	3.6825	0.5001E+13
434	148.200	6.0	1575.320	6.0	70.071	6.2483	0.8488E+13
435	220.438	4.0	1649.102	4.0	69.995	2.8553	0.3887E+13
436	96.821	5.0	1525.906	4.0	69.975	0.7629	0.1039E+13
437	101.506	2.0	1530.699	1.0	69.970	0.7499	0.1022E+13
438	237.602	1.0	1666.975	0.0	69.961	0.3754	0.5115E+12
439	114.225	4.0	1543.670	4.0	69.957	0.4397	0.5993E+12
440	128.882	3.0	1559.242	2.0	69.912	0.1396	0.1905E+12
441	182.887	2.0	1613.358	3.0	69.907	0.1150	0.1570E+12
442	214.468	2.0	1645.062	3.0	69.901	0.1566	0.2137E+12
443	147.292	2.0	1578.465	1.0	69.873	0.1555	0.2124E+12
444	228.968	2.0	1660.434	1.0	69.858	0.1313	0.1794E+12
445	128.882	3.0	1561.252	3.0	69.814	0.1069	0.1463E+12
446	228.968	2.0	1661.621	2.0	69.801	1.8173	0.2488E+13
447	21.736	2.0	1455.798	2.0	69.732	0.1699	0.2331E+12
448	320.377	2.0	1754.805	1.0	69.714	0.5147	0.7064E+12
449	123.982	2.0	1559.242	2.0	69.674	0.1155	0.1587E+12
450	139.509	5.0	1575.320	6.0	69.647	0.5285	0.7267E+12

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
451	214.468	2.0	1650.354	1.0	69.643	0.1746	0.2401E+12
452	41.037	4.0	1477.270	3.0	69.627	0.3300	0.4541E+12
453	220.438	4.0	1656.685	5.0	69.626	0.1230	0.1692E+12
454	97.267	3.0	1533.772	3.0	69.613	0.0912	0.1255E+12
455	114.225	4.0	1550.915	4.0	69.604	0.0822	0.1132E+12
456	232.277	3.0	1669.205	3.0	69.593	0.4933	0.6793E+12
457	123.982	2.0	1561.252	3.0	69.576	0.1327	0.1828E+12
458	123.756	4.0	1561.252	3.0	69.565	1.0028	0.1382E+13
459	193.931	3.0	1632.547	4.0	69.511	0.1353	0.1868E+12
460	214.468	2.0	1653.756	2.0	69.479	0.6314	0.8724E+12
461	140.212	3.0	1579.543	3.0	69.477	0.3395	0.4691E+12
462	114.225	4.0	1553.914	5.0	69.459	0.4349	0.6013E+12
463	232.277	3.0	1672.722	3.0	69.423	2.1007	0.2907E+13
464	193.931	3.0	1635.871	2.0	69.351	1.4622	0.2028E+13
465	170.293	4.0	1613.358	3.0	69.297	0.0995	0.1382E+12
466	248.962	0.0	1692.192	1.0	69.289	0.6464	0.8980E+12
467	228.968	2.0	1672.722	3.0	69.264	0.1485	0.2065E+12
468	32.094	3.0	1475.887	2.0	69.262	0.5333	0.7414E+12
469	32.094	3.0	1477.270	3.0	69.196	0.0909	0.1266E+12
470	32.094	3.0	1477.429	2.0	69.188	0.9977	0.1390E+13
471	10.449	1.0	1455.798	2.0	69.187	0.0831	0.1158E+12
472	101.506	2.0	1546.890	2.0	69.186	0.0857	0.1194E+12
473	214.468	2.0	1660.434	1.0	69.158	0.6544	0.9126E+12
474	101.506	2.0	1547.989	2.0	69.133	0.1530	0.2136E+12
475	252.027	4.0	1698.596	3.0	69.129	0.4468	0.6236E+12
476	232.277	3.0	1679.003	4.0	69.122	0.5239	0.7314E+12
477	214.468	2.0	1661.621	2.0	69.101	0.1532	0.2140E+12
478	10.449	1.0	1457.905	1.0	69.087	0.1874	0.2618E+12
479	139.509	5.0	1587.808	5.0	69.047	0.6401	0.8956E+12
480	232.277	3.0	1680.923	2.0	69.030	0.6232	0.8723E+12
481	220.438	4.0	1669.205	3.0	69.024	2.3763	0.3327E+13
482	128.882	3.0	1579.543	3.0	68.934	0.1420	0.1993E+12
483	97.267	3.0	1547.989	2.0	68.931	0.2490	0.3495E+12
484	193.931	3.0	1645.062	3.0	68.912	0.5191	0.7291E+12
485	220.438	4.0	1672.722	3.0	68.857	0.9080	0.1277E+13
486	140.212	3.0	1592.976	2.0	68.834	0.5089	0.7163E+12
487	80.010	4.0	1533.772	3.0	68.787	0.3135	0.4418E+12
488	96.821	5.0	1550.915	4.0	68.771	1.2576	0.1774E+13
489	21.736	2.0	1475.887	2.0	68.769	0.3733	0.5265E+12
490	140.212	3.0	1594.478	3.0	68.763	0.2702	0.3812E+12
491	123.982	2.0	1578.465	1.0	68.753	0.0881	0.1243E+12
492	176.117	0.0	1630.731	1.0	68.747	0.1749	0.2468E+12
493	214.468	2.0	1669.205	3.0	68.741	0.2149	0.3033E+12
494	193.931	3.0	1649.102	4.0	68.720	0.1688	0.2383E+12
495	21.736	2.0	1477.429	2.0	68.696	0.6607	0.9338E+12
496	123.756	4.0	1579.543	3.0	68.691	0.3157	0.4462E+12
497	41.037	4.0	1497.694	3.0	68.650	0.2930	0.4146E+12
498	101.506	2.0	1559.242	2.0	68.600	0.5376	0.7620E+12
499	147.292	2.0	1605.244	2.0	68.589	0.1799	0.2550E+12
500	214.468	2.0	1672.722	3.0	68.575	0.2701	0.3831E+12

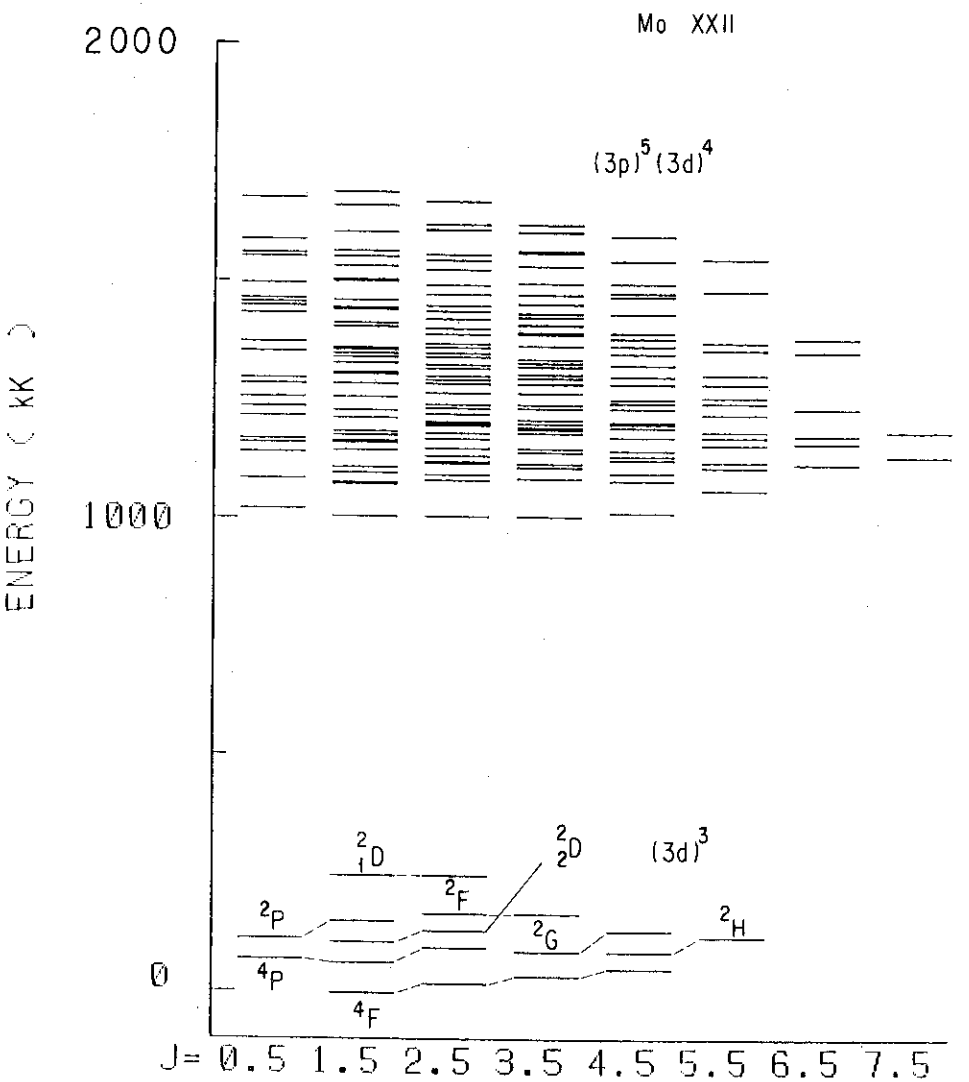
NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
501	220.438	4.0	1679.003	4.0	68.561	0.3640	0.5165E+12
502	237.602	1.0	1696.256	2.0	68.556	0.7332	0.1040E+13
503	140.212	3.0	1598.979	3.0	68.551	0.4469	0.6343E+12
504	193.931	3.0	1653.756	2.0	68.501	0.1547	0.2199E+12
505	97.267	3.0	1559.242	2.0	68.401	0.9705	0.1384E+13
506	228.968	2.0	1692.192	1.0	68.342	1.0291	0.1470E+13
507	97.267	3.0	1561.252	3.0	68.307	0.5421	0.7750E+12
508	232.277	3.0	1696.256	2.0	68.307	1.7459	0.2496E+13
509	128.882	3.0	1594.478	3.0	68.232	0.1815	0.2600E+12
510	147.292	2.0	1613.358	3.0	68.210	0.0964	0.1381E+12
511	232.277	3.0	1698.596	3.0	68.198	0.1284	0.1841E+12
512	214.468	2.0	1680.923	2.0	68.192	0.2102	0.3015E+12
513	41.037	4.0	1507.716	3.0	68.181	0.1073	0.1540E+12
514	10.449	1.0	1477.429	2.0	68.167	0.1798	0.2581E+12
515	182.887	2.0	1650.354	1.0	68.145	0.9060	0.1301E+13
516	123.982	2.0	1592.976	2.0	68.074	0.1376	0.1980E+12
517	123.756	4.0	1593.982	4.0	68.017	0.7233	0.1043E+13
518	104.843	6.0	1575.320	6.0	68.005	0.1254	0.1808E+12
519	123.756	4.0	1594.478	3.0	67.994	0.3054	0.4406E+12
520	80.010	4.0	1550.915	4.0	67.985	0.0818	0.1181E+12
521	148.200	6.0	1621.695	5.0	67.866	0.4110	0.5951E+12
522	176.117	0.0	1650.354	1.0	67.832	0.2768	0.4012E+12
523	170.293	4.0	1645.062	3.0	67.807	2.7398	0.3974E+13
524	123.756	4.0	1598.979	3.0	67.786	0.1732	0.2515E+12
525	193.931	3.0	1669.205	3.0	67.784	0.9082	0.1318E+13
526	101.506	2.0	1578.465	1.0	67.707	0.1515	0.2204E+12
527	182.887	2.0	1660.434	1.0	67.680	0.3094	0.4505E+12
528	193.931	3.0	1672.722	3.0	67.623	0.2480	0.3617E+12
529	99.152	1.0	1578.465	1.0	67.599	0.2900	0.4232E+12
530	41.037	4.0	1520.886	3.0	67.574	1.3053	0.1907E+13
531	114.225	4.0	1594.478	3.0	67.556	1.2914	0.1887E+13
532	80.010	4.0	1561.252	3.0	67.511	0.7117	0.1042E+13
533	154.459	1.0	1635.871	2.0	67.503	0.1019	0.1491E+12
534	139.509	5.0	1621.695	5.0	67.468	0.3815	0.5590E+12
535	97.267	3.0	1579.543	3.0	67.464	0.4275	0.6265E+12
536	104.843	6.0	1587.808	5.0	67.433	0.2747	0.4030E+12
537	147.292	2.0	1630.731	1.0	67.411	0.5998	0.8804E+12
538	101.506	2.0	1585.268	2.0	67.396	0.0873	0.1282E+12
539	128.882	3.0	1613.358	3.0	67.364	0.5467	0.8036E+12
540	114.225	4.0	1598.979	3.0	67.351	1.0615	0.1561E+13
541	252.027	4.0	1737.915	3.0	67.300	3.8892	0.5727E+13
542	41.037	4.0	1527.114	3.0	67.291	1.3106	0.1930E+13
543	182.887	2.0	1669.205	3.0	67.280	0.1652	0.2433E+12
544	97.267	3.0	1585.268	2.0	67.204	0.6672	0.9853E+12
545	32.094	3.0	1520.886	3.0	67.169	0.3297	0.4874E+12
546	123.756	4.0	1613.358	3.0	67.132	0.2359	0.3491E+12
547	96.821	5.0	1587.808	5.0	67.070	0.1112	0.1649E+12
548	140.212	3.0	1632.547	4.0	67.009	0.2101	0.3121E+12
549	41.037	4.0	1533.772	3.0	66.991	0.1784	0.2652E+12
550	139.509	5.0	1632.547	4.0	66.978	4.4132	0.6562E+13

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
551	99.152	1.0	1592.976	2.0	66.942	0.0801	0.1193E+12
552	32.094	3.0	1527.114	3.0	66.889	0.4558	0.6794E+12
553	140.212	3.0	1635.871	2.0	66.860	0.1837	0.2740E+12
554	97.267	3.0	1592.976	2.0	66.858	0.3331	0.4971E+12
555	154.459	1.0	1650.354	1.0	66.850	0.1670	0.2492E+12
556	320.377	2.0	1816.465	1.0	66.841	1.6381	0.2446E+13
557	96.821	5.0	1593.982	4.0	66.793	1.4524	0.2171E+13
558	97.267	3.0	1594.478	3.0	66.791	0.1086	0.1624E+12
559	170.293	4.0	1669.205	3.0	66.715	0.8991	0.1347E+13
560	114.225	4.0	1613.358	3.0	66.705	1.3088	0.1962E+13
561	80.010	4.0	1579.543	3.0	66.687	1.8420	0.2763E+13
562	193.931	3.0	1696.256	2.0	66.563	0.0869	0.1308E+12
563	193.931	3.0	1698.596	3.0	66.460	0.2838	0.4286E+12
564	21.736	2.0	1527.114	3.0	66.429	0.0969	0.1465E+12
565	232.277	3.0	1737.915	3.0	66.417	0.1201	0.1816E+12
566	154.459	1.0	1660.434	1.0	66.402	0.1080	0.1633E+12
567	123.982	2.0	1630.731	1.0	66.368	0.1088	0.1648E+12
568	128.882	3.0	1635.871	2.0	66.357	0.4195	0.6354E+12
569	97.267	3.0	1605.244	2.0	66.314	0.0895	0.1358E+12
570	148.200	6.0	1656.685	5.0	66.292	7.8538	0.1192E+14
571	170.293	4.0	1679.003	4.0	66.282	0.3761	0.5709E+12
572	139.509	5.0	1649.102	4.0	66.243	1.0673	0.1622E+13
573	154.459	1.0	1666.975	0.0	66.115	0.3952	0.6030E+12
574	147.292	2.0	1660.434	1.0	66.088	0.2462	0.3760E+12
575	140.212	3.0	1653.756	2.0	66.070	0.3982	0.6085E+12
576	80.010	4.0	1594.478	3.0	66.030	0.0813	0.1244E+12
577	104.843	6.0	1621.695	5.0	65.926	6.7256	0.1032E+14
578	237.602	1.0	1754.805	1.0	65.911	0.0802	0.1232E+12
579	80.010	4.0	1598.979	3.0	65.834	0.1471	0.2264E+12
580	41.037	4.0	1561.252	3.0	65.780	0.1288	0.1985E+12
581	123.756	4.0	1645.062	3.0	65.733	0.2630	0.4060E+12
582	140.212	3.0	1661.621	2.0	65.729	0.3469	0.5356E+12
583	128.882	3.0	1653.756	2.0	65.579	0.2249	0.3488E+12
584	96.821	5.0	1621.695	5.0	65.579	0.5222	0.8099E+12
585	123.756	4.0	1649.102	4.0	65.559	0.6198	0.9619E+12
586	170.293	4.0	1698.596	3.0	65.432	0.1651	0.2573E+12
587	114.225	4.0	1645.062	3.0	65.324	0.3371	0.5268E+12
588	80.010	4.0	1613.358	3.0	65.217	0.8244	0.1293E+13
589	96.821	5.0	1632.547	4.0	65.116	0.9508	0.1496E+13
590	123.982	2.0	1660.434	1.0	65.085	0.2217	0.3490E+12
591	139.509	5.0	1679.003	4.0	64.956	0.4930	0.7794E+12
592	128.882	3.0	1672.722	3.0	64.774	0.1588	0.2524E+12
593	193.931	3.0	1737.915	3.0	64.768	0.1036	0.1647E+12
594	123.756	4.0	1672.722	3.0	64.559	0.7404	0.1185E+13
595	104.843	6.0	1656.685	5.0	64.440	0.3893	0.6253E+12
596	96.821	5.0	1649.102	4.0	64.421	1.2911	0.2075E+13
597	114.225	4.0	1672.722	3.0	64.164	0.1450	0.2349E+12
598	99.152	1.0	1660.434	1.0	64.050	0.1085	0.1764E+12
599	97.267	3.0	1661.621	2.0	63.924	0.1439	0.2348E+12
600	80.010	4.0	1645.062	3.0	63.896	0.1192	0.1947E+12

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
601	128.882	3.0	1696.256	2.0	63.801	0.1480	0.2425E+12
602	170.293	4.0	1737.915	3.0	63.791	0.3171	0.5198E+12
603	123.756	4.0	1698.596	3.0	63.499	0.1346	0.2227E+12
604	123.756	4.0	1737.915	3.0	61.952	0.1192	0.2071E+12



Mo XXII　グロトリアン・ダイアグラム



Mo XXII　エネルギーレベル
$(3d)^3$, $(3p)^5(3d)^4$

Mo XXII　エネルギーレベル

EVEN　$(3d)^3$

ODD　$(3p)^5\ (3d)^4$

EVEN PARITY

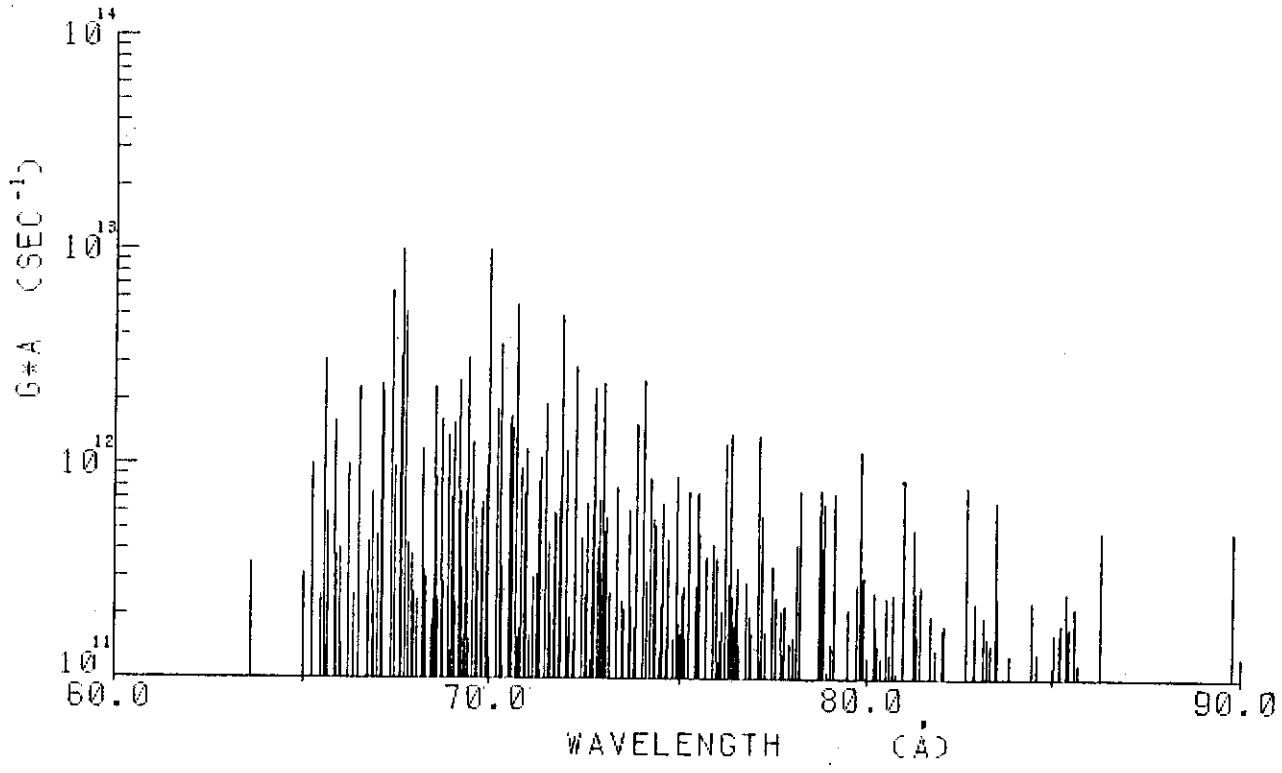
J	NO	ENERGY(KK)		LEADING PERCENTAGES			
0.5	1	70.080	---	1	4P 76.8%	1	2P 23.2%
0.5	2	112.342	---	1	2P 76.8%	1	4P 23.2%
1.5	1	-0.002	---	1	4F 89.9%	1	2D 5.8%
1.5	2	62.745	---	1	4P 52.9%	1	2P 31.6%
1.5	3	105.799	---	1	4P 37.6%	1	2D 36.9%
1.5	4	148.881	---	1	2P 58.6%	1	2D 19.2%
1.5	5	247.163	---	1	2D 69.1%	1	2D 30.5%
2.5	1	17.728	---	1	4F 96.7%	1	2D 2.2%
2.5	2	94.018	---	1	4P 92.6%	1	2D 4.6%
2.5	3	131.154	---	1	2D 80.8%	1	2D 10.6%
2.5	4	164.709	---	1	2F 90.5%	1	2D 4.8%
2.5	5	246.198	---	1	2D 79.2%	1	2D 11.0%
3.5	1	34.555	---	1	4F 92.9%	1	2G 6.2%
3.5	2	84.559	---	1	2G 91.2%	1	4F 6.8%
3.5	3	164.709	---	1	2F 97.1%	1	2G 2.6%
4.5	1	48.337	---	1	4F 76.9%	1	2G 19.7%
4.5	2	87.506	---	1	2H 55.9%	1	2G 26.5%
4.5	3	130.258	---	1	2G 53.9%	1	2H 40.6%
5.5	1	119.227	---	1	2H100.0%		

ODD J	PARITY NO	ENERGY(KK)		LEADING PERCENTAGES	
0.5	1	1022.462	---	1 (5D) 6D 76.6%	1 (5D) 4P 8.4%
0.5	2	1086.677	---	1 (3F) 4D 27.0%	1 (5D) 4D 20.3%
0.5	3	1141.900	---	1 (5D) 6F 37.2%	1 (3F) 4D 12.4%
0.5	4	1162.737	---	1 (3D) 4P 30.9%	1 (5D) 6D 12.9%
0.5	5	1169.531	---	1 (3P) 4P 21.5%	1 (5D) 6F 17.6%
0.5	6	1217.030	---	1 (3F) 4D 24.8%	1 (3P) 4P 15.0%
0.5	7	1237.610	---	1 (3F) 4D 32.3%	1 (3P) 4P 13.1%
0.5	8	1256.787	---	1 (3P) 4D 16.1%	1 (5D) 6F 15.5%
0.5	9	1284.311	---	1 (3P) 2S 35.8%	1 (3P) 4P 21.7%
0.5	10	1298.200	---	1 (3P) 4D 27.3%	1 (3F) 4D 16.2%
0.5	11	1354.265	---	1 (3P) 2P 17.9%	1 (3F) 4D 15.2%
0.5	12	1372.583	---	1 (3D) 4D 29.8%	1 (1D) 2P 20.5%
0.5	13	1435.579	---	1 (5D) 4P 20.8%	1 (3P) 4P 17.0%
0.5	14	1450.675	---	1 (3P) 4D 33.2%	1 (1D) 2P 20.4%
0.5	15	1457.103	---	1 (3P) 2S 43.1%	1 (3P) 2S 11.1%
0.5	16	1466.608	---	1 (5D) 4D 46.1%	1 (3F) 4D 9.3%
0.5	17	1496.243	---	1 (3P) 2P 33.6%	1 (1D) 2P 19.3%
0.5	18	1554.100	---	1 (3P) 2P 26.1%	1 (1S) 2P 21.0%
0.5	19	1560.506	---	1 (3P) 2S 31.4%	1 (5D) 4P 23.1%
0.5	20	1591.361	---	1 (3P) 2P 29.6%	1 (1D) 2P 24.7%
0.5	21	1679.522	---	1 (1S) 2P 68.0%	1 (1S) 2P 21.9%
1.5	1	1007.610	---	1 (5D) 6D 65.0%	1 (5D) 6P 11.5%
1.5	2	1073.771	---	1 (5D) 6P 37.4%	1 (5D) 6F 14.5%
1.5	3	1079.434	---	1 (5D) 6P 16.1%	1 (5D) 6D 12.5%
1.5	4	1099.303	---	1 (3G) 4F 25.8%	1 (5D) 4F 18.2%
1.5	5	1109.743	---	1 (5D) 6P 18.1%	1 (3P) 4P 12.6%
1.5	6	1145.300	---	1 (3P) 4S 13.8%	1 (3G) 4F 9.0%
1.5	7	1160.425	---	1 (3F) 4F 26.4%	1 (3F) 4F 12.1%
1.5	8	1164.921	---	1 (5D) 6F 46.8%	1 (3F) 4D 7.5%
1.5	9	1177.842	---	1 (3P) 2D 13.6%	1 (3P) 4S 13.2%
1.5	10	1185.849	---	1 (3D) 4P 24.3%	1 (5D) 6D 11.1%
1.5	11	1215.744	---	1 (1S) 2P 26.4%	1 (3D) 2P 20.6%
1.5	12	1228.647	---	1 (3F) 4D 27.0%	1 (3P) 4D 25.2%
1.5	13	1257.150	---	1 (1F) 2D 21.9%	1 (3D) 2D 19.8%
1.5	14	1259.645	---	1 (3P) 4P 16.2%	1 (3P) 4S 14.8%
1.5	15	1287.398	---	1 (3P) 4P 16.8%	1 (3P) 4D 9.8%
1.5	16	1304.872	---	1 (3F) 2D 11.1%	1 (3F) 2D 8.6%
1.5	17	1311.924	---	1 (5D) 4F 20.6%	1 (3D) 4F 16.4%
1.5	18	1331.969	---	1 (3D) 4D 16.4%	1 (1D) 2D 11.8%
1.5	19	1342.268	---	1 (3F) 4D 16.2%	1 (1D) 2D 12.5%
1.5	20	1350.086	---	1 (3F) 4F 16.4%	1 (3P) 2P 12.0%
1.5	21	1357.742	---	1 (3P) 4P 20.8%	1 (3P) 4D 11.2%
1.5	22	1362.795	---	1 (3D) 4F 22.0%	1 (3P) 2D 9.5%
1.5	23	1405.973	---	1 (3P) 4S 20.7%	1 (3D) 4D 12.4%
1.5	24	1414.584	---	1 (3P) 4S 15.6%	1 (1D) 2D 12.6%
1.5	25	1442.976	---	1 (3F) 2D 19.2%	1 (3F) 4F 13.6%
1.5	26	1447.497	---	1 (3P) 4D 28.2%	1 (1S) 2P 19.0%
1.5	27	1462.368	---	1 (5D) 4D 14.9%	1 (5D) 4P 12.7%
1.5	28	1503.199	---	1 (3D) 2P 25.2%	1 (5D) 4P 17.8%

ODD J	PARITY NO	ENERGY(KK)		LEADING PERCENTAGES	
1.5	29	1507.124	---	1 (5D) 4D 26.5%	1 (3P) 2D 11.5%
1.5	30	1535.235	---	1 (5D) 4P 16.8%	1 (1D) 2P 11.7%
1.5	31	1553.334	---	1 (1S) 2P 20.8%	1 (1D) 2P 19.9%
1.5	32	1567.469	---	1 (3D) 2D 17.2%	1 (3F) 2D 15.9%
1.5	33	1607.108	---	1 (3P) 2P 34.2%	1 (1D) 2P 23.8%
1.5	34	1663.992	---	1 (1D) 2P 27.6%	1 (3P) 2P 25.5%
1.5	35	1688.266	---	1 (3F) 2D 45.9%	1 (3D) 2D 14.4%
2.5	1	1004.385	---	1 (5D) 6D 71.1%	1 (5D) 6P 9.9%
2.5	2	1081.360	---	1 (5D) 6F 26.3%	1 (5D) 6P 21.4%
2.5	3	1093.614	---	1 (3G) 4F 21.9%	1 (5D) 4F 18.6%
2.5	4	1119.502	---	1 (3F) 4F 12.5%	1 (3P) 4P 11.7%
2.5	5	1123.005	---	1 (3D) 4D 20.7%	1 (3D) 4P 18.5%
2.5	6	1132.539	---	1 (3P) 4P 14.3%	1 (3P) 4P 11.7%
2.5	7	1149.424	---	1 (3G) 4G 20.6%	1 (3H) 4G 14.5%
2.5	8	1170.744	---	1 (3P) 4P 14.7%	1 (3P) 2D 6.1%
2.5	9	1182.557	---	1 (5D) 6F 28.6%	1 (3G) 4F 11.3%
2.5	10	1197.460	---	1 (3G) 4G 11.0%	1 (3H) 4G 10.1%
2.5	11	1200.364	---	1 (3D) 2D 12.5%	1 (3G) 4G 9.8%
2.5	12	1205.869	---	1 (3H) 4G 29.8%	1 (3F) 2F 9.9%
2.5	13	1221.982	---	1 (3P) 4P 14.7%	1 (3P) 4D 13.0%
2.5	14	1235.109	---	1 (1D) 2D 19.9%	1 (3G) 4G 17.9%
2.5	15	1243.067	---	1 (3D) 2F 23.6%	1 (3D) 4F 11.0%
2.5	16	1266.991	---	1 (3F) 4D 13.4%	1 (3F) 2D 8.6%
2.5	17	1287.268	---	1 (3D) 4F 15.6%	1 (3F) 4G 12.1%
2.5	18	1293.523	---	1 (3D) 4F 12.3%	1 (3F) 4D 10.6%
2.5	19	1300.833	---	1 (1F) 2F 17.5%	1 (3F) 4G 13.7%
2.5	20	1317.086	---	1 (1D) 2D 12.0%	1 (3F) 4F 9.3%
2.5	21	1324.512	---	1 (3F) 4F 17.3%	1 (1G) 2F 12.5%
2.5	22	1342.883	---	1 (3F) 4G 18.6%	1 (5D) 4F 13.7%
2.5	23	1351.694	---	1 (3F) 4G 10.7%	1 (3P) 4D 9.2%
2.5	24	1363.104	---	1 (1D) 2D 12.6%	1 (3D) 4D 12.5%
2.5	25	1371.193	---	1 (1D) 2D 11.1%	1 (3P) 4P 10.0%
2.5	26	1389.318	---	1 (1F) 2F 15.6%	1 (1G) 2F 12.1%
2.5	27	1401.388	---	1 (3F) 4G 14.7%	1 (3F) 4D 10.2%
2.5	28	1422.063	---	1 (3F) 4F 18.7%	1 (3F) 4D 12.1%
2.5	29	1438.514	---	1 (1D) 2F 14.1%	1 (1G) 2F 10.6%
2.5	30	1451.164	---	1 (5D) 4P 17.5%	1 (5D) 4D 16.7%
2.5	31	1472.701	---	1 (1F) 2D 18.1%	1 (3P) 2D 13.8%
2.5	32	1493.677	---	1 (3F) 2F 25.4%	1 (3D) 2F 21.6%
2.5	33	1524.544	---	1 (5D) 4D 28.4%	1 (3P) 2D 8.5%
2.5	34	1545.305	---	1 (1D) 2F 15.6%	1 (5D) 4D 14.5%
2.5	35	1556.015	---	1 (1D) 2F 20.2%	1 (3P) 2D 16.0%
2.5	36	1558.994	---	1 (3F) 2F 33.6%	1 (1F) 2F 18.6%
2.5	37	1610.326	---	1 (3G) 2F 46.2%	1 (1D) 2F 13.8%
2.5	38	1623.869	---	1 (3P) 2D 19.0%	1 (1D) 2F 13.0%
2.5	39	1669.227	---	1 (3F) 2D 37.9%	1 (3D) 2D 12.5%
3.5	1	1006.312	---	1 (5D) 6D 75.7%	1 (5D) 6F 13.1%
3.5	2	1084.322	---	1 (5D) 6F 16.2%	1 (5D) 6P 15.4%
3.5	3	1087.744	---	1 (5D) 6F 30.4%	1 (5D) 4F 19.5%

ODD J	PARITY NO	ENERGY(KK)		LEADING PERCENTAGES	
3.5	4	1109.180	---	1 (3D) 4F 16.9%	1 (3F) 4F 15.0%
3.5	5	1118.192	---	1 (3H) 4H 31.4%	1 (3H) 2G 10.9%
3.5	6	1140.985	---	1 (3F) 4G 25.3%	1 (3H) 4G 21.4%
3.5	7	1148.986	---	1 (3P) 4D 41.8%	1 (3D) 4D 9.7%
3.5	8	1182.588	---	1 (3H) 4H 11.6%	1 (5D) 6P 9.9%
3.5	9	1188.390	---	1 (3P) 4D 16.4%	1 (3G) 4G 12.2%
3.5	10	1194.589	---	1 (1D) 2F 15.7%	1 (1D) 2F 9.5%
3.5	11	1203.327	---	1 (3G) 4F 23.3%	1 (1D) 2F 9.9%
3.5	12	1208.080	---	1 (5D) 6P 19.8%	1 (3G) 4G 11.8%
3.5	13	1235.753	---	1 (3P) 4D 19.8%	1 (3P) 4D 7.1%
3.5	14	1235.942	---	1 (3F) 4G 14.2%	1 (3D) 4F 13.7%
3.5	15	1241.657	---	1 (3G) 4H 24.7%	1 (3H) 4G 15.3%
3.5	16	1264.064	---	1 (1F) 2G 23.5%	1 (1F) 2F 16.8%
3.5	17	1285.923	---	1 (3G) 4G 17.7%	1 (3H) 4G 15.2%
3.5	18	1296.020	---	1 (1G) 2G 15.6%	1 (3F) 4D 9.3%
3.5	19	1306.655	---	1 (1G) 2G 20.1%	1 (3G) 4H 13.0%
3.5	20	1323.238	---	1 (3F) 4G 16.5%	1 (3H) 4G 11.5%
3.5	21	1331.852	---	1 (3F) 4D 14.5%	1 (3F) 4F 11.6%
3.5	22	1336.107	---	1 (3F) 2G 14.9%	1 (3F) 4G 13.1%
3.5	23	1364.021	---	1 (3F) 4D 28.0%	1 (1D) 2F 13.7%
3.5	24	1388.010	---	1 (5D) 4F 21.8%	1 (3G) 2G 9.8%
3.5	25	1394.687	---	1 (1G) 2F 11.0%	1 (3G) 2G 10.4%
3.5	26	1410.079	---	1 (3F) 2F 11.4%	1 (3G) 4F 10.0%
3.5	27	1426.592	---	1 (1D) 2F 15.9%	1 (1F) 2F 13.8%
3.5	28	1433.076	---	1 (1F) 2F 25.3%	1 (1F) 2G 10.1%
3.5	29	1454.313	---	1 (3G) 2G 19.6%	1 (1G) 2G 18.3%
3.5	30	1472.673	---	1 (3F) 2G 23.0%	1 (1G) 2F 15.5%
3.5	31	1499.424	---	1 (1G) 2G 19.6%	1 (3G) 2F 11.8%
3.5	32	1532.582	---	1 (5D) 4D 55.4%	1 (3F) 4D 11.3%
3.5	33	1563.723	---	1 (3F) 2F 24.7%	1 (3G) 2F 14.2%
3.5	34	1566.614	---	1 (1G) 2F 28.6%	1 (3D) 2F 21.5%
3.5	35	1606.324	---	1 (3H) 2G 16.1%	1 (3G) 2G 11.1%
3.5	36	1620.464	---	1 (1G) 2F 26.6%	1 (3F) 2F 20.2%
4.5	1	1013.376	---	1 (5D) 6D 78.2%	1 (5D) 6F 15.1%
4.5	2	1082.092	---	1 (5D) 6F 57.5%	1 (5D) 4F 14.5%
4.5	3	1097.792	---	1 (3H) 4H 14.5%	1 (3G) 4G 12.5%
4.5	4	1126.622	---	1 (3H) 4H 26.8%	1 (3F) 4G 23.1%
4.5	5	1135.734	---	1 (3H) 2G 16.0%	1 (3G) 4G 11.7%
4.5	6	1147.682	---	1 (3G) 4H 26.9%	1 (1G) 2G 11.3%
4.5	7	1172.059	---	1 (3F) 4G 24.6%	1 (3G) 2H 20.0%
4.5	8	1195.482	---	1 (3H) 4I 21.5%	1 (3H) 2G 11.6%
4.5	9	1201.888	---	1 (3D) 4F 27.9%	1 (3F) 2G 15.6%
4.5	10	1206.661	---	1 (1F) 2G 36.0%	1 (3G) 4F 16.8%
4.5	11	1232.801	---	1 (3H) 4I 28.1%	1 (3H) 4H 9.5%
4.5	12	1245.411	---	1 (3F) 4F 16.8%	1 (1G) 2G 13.1%
4.5	13	1254.710	---	1 (3F) 4G 37.6%	1 (3G) 4H 26.2%
4.5	14	1287.224	---	1 (1I) 2H 14.8%	1 (3G) 4G 14.8%
4.5	15	1301.527	---	1 (1G) 2H 16.7%	1 (1G) 2G 16.6%
4.5	16	1325.063	---	1 (3H) 4G 18.6%	1 (1G) 2H 16.3%

ODD J	PARITY NO	ENERGY(KK)		LEADING PERCENTAGES	
4.5	17	1349.612	---	1 (3H) 4G 13.3%	1 (3F) 4F 12.6%
4.5	18	1365.945	---	1 (3F) 4F 19.1%	1 (1G) 2H 18.0%
4.5	19	1381.809	---	1 (3G) 2H 25.2%	1 (1I) 2H 17.1%
4.5	20	1395.473	---	1 (3F) 2G 32.3%	1 (1G) 2H 13.0%
4.5	21	1432.251	---	1 (5D) 4F 26.1%	1 (3G) 4F 11.7%
4.5	22	1471.637	---	1 (3H) 2H 20.6%	1 (1G) 2H 16.0%
4.5	23	1478.290	---	1 (3H) 2H 21.3%	1 (3F) 2G 16.3%
4.5	24	1499.569	---	1 (3G) 2G 25.6%	1 (3F) 2G 18.0%
4.5	25	1545.185	---	1 (3H) 2H 29.2%	1 (1G) 2G 15.6%
4.5	26	1598.130	---	1 (3H) 2G 20.6%	1 (3G) 2G 20.1%
5.5	1	1062.273	---	1 (5D) 6F 86.6%	1 (3F) 4G 9.0%
5.5	2	1110.351	---	1 (3H) 4H 32.1%	1 (3G) 4H 23.2%
5.5	3	1122.803	---	1 (3F) 4G 52.2%	1 (3H) 4G 9.6%
5.5	4	1159.388	---	1 (3H) 4I 27.7%	1 (3G) 4G 21.7%
5.5	5	1173.747	---	1 (3G) 4H 28.3%	1 (3G) 2H 16.8%
5.5	6	1184.199	---	1 (3H) 4H 24.0%	1 (3H) 2I 23.2%
5.5	7	1222.525	---	1 (1G) 2H 35.0%	1 (1G) 2H 22.3%
5.5	8	1246.528	---	1 (3G) 4H 21.6%	1 (1I) 2I 20.1%
5.5	9	1258.012	---	1 (3F) 4G 49.7%	1 (3G) 4G 15.4%
5.5	10	1287.529	---	1 (3H) 2I 23.7%	1 (3H) 4I 22.0%
5.5	11	1306.077	---	1 (1G) 2H 39.4%	1 (1G) 2H 27.1%
5.5	12	1358.090	---	1 (3H) 4G 49.7%	1 (3H) 4H 12.3%
5.5	13	1372.806	---	1 (3G) 2H 35.0%	1 (1I) 2I 22.7%
5.5	14	1480.963	---	1 (3H) 2H 28.5%	1 (1I) 2H 21.9%
5.5	15	1548.870	---	1 (3H) 2H 47.2%	1 (1I) 2H 33.8%
6.5	1	1118.921	---	1 (3H) 4I 37.3%	1 (3H) 4H 34.5%
6.5	2	1163.488	---	1 (3H) 2I 34.1%	1 (3H) 4H 28.9%
6.5	3	1178.055	---	1 (3G) 4H 71.6%	1 (3H) 4I 16.6%
6.5	4	1233.090	---	1 (1I) 2K 48.8%	1 (1I) 2I 38.4%
6.5	5	1353.884	---	1 (3H) 2I 64.9%	1 (3H) 4I 15.9%
6.5	6	1382.652	---	1 (1I) 2I 50.4%	1 (1I) 2K 47.3%
7.5	1	1134.391	---	1 (3H) 4I 87.5%	1 (1I) 2K 12.5%
7.5	2	1186.898	---	1 (1I) 2K 87.5%	1 (3H) 4I 12.5%



Mo XXII　スペクトル・パターン
$(3d)^3 - (3p)^5\ (3d)^4$

Mo XXII　波長，振動子強度

$(3d)^3 - (3p)^5\ (3d)^4$

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
1	34.555	3.5	1126.621	4.5	91.570	0.0975	0.7756E+11
2	87.506	4.5	1184.199	5.5	91.183	0.2737	0.2196E+12
3	84.559	3.5	1195.481	4.5	90.015	0.1244	0.1024E+12
4	119.227	5.5	1233.089	6.5	89.778	0.5931	0.4908E+12
5	148.881	1.5	1266.990	2.5	89.437	0.0888	0.7404E+11
6	17.728	2.5	1140.984	3.5	89.027	0.1180	0.9934E+11
7	105.798	1.5	1243.067	2.5	87.930	0.1168	0.1008E+12
8	48.337	4.5	1194.589	3.5	87.241	0.1011	0.8857E+11
9	48.337	4.5	1195.481	4.5	87.173	0.0809	0.7102E+11
10	48.337	4.5	1201.887	4.5	86.689	0.1018	0.9033E+11
11	87.506	4.5	1245.411	4.5	86.363	0.0941	0.8413E+11
12	87.506	4.5	1246.527	5.5	86.280	0.5457	0.4890E+12
13	62.745	1.5	1228.646	1.5	85.771	0.1034	0.9373E+11
14	34.555	3.5	1201.887	4.5	85.665	0.1282	0.1165E+12
15	119.227	5.5	1287.528	5.5	85.594	0.2378	0.2165E+12
16	34.555	3.5	1203.327	3.5	85.560	0.0947	0.8625E+11
17	131.154	2.5	1300.833	2.5	85.494	0.0878	0.8013E+11
18	84.559	3.5	1254.710	4.5	85.459	0.1912	0.1746E+12
19	17.728	2.5	1188.390	3.5	85.422	0.1833	0.1675E+12
20	130.258	4.5	1301.526	4.5	85.378	0.2748	0.2514E+12
21	164.709	2.5	1336.106	3.5	85.368	0.0906	0.8295E+11
22	34.555	3.5	1208.080	3.5	85.213	0.1964	0.1804E+12
23	48.337	4.5	1222.524	5.5	85.165	0.1784	0.1640E+12
24	130.258	4.5	1306.077	5.5	85.047	0.1763	0.1626E+12
25	17.728	2.5	1194.589	3.5	84.972	0.0937	0.8652E+11
26	105.798	1.5	1287.397	1.5	84.631	0.0807	0.7518E+11
27	-0.002	1.5	1182.556	2.5	84.562	0.1420	0.1325E+12
28	48.337	4.5	1232.801	4.5	84.426	0.2463	0.2305E+12
29	17.728	2.5	1205.868	2.5	84.165	0.0901	0.8485E+11
30	247.163	1.5	1438.514	2.5	83.938	0.1072	0.1015E+12
31	130.258	4.5	1323.237	3.5	83.824	0.1378	0.1308E+12
32	-0.002	1.5	1197.460	2.5	83.510	0.2526	0.2416E+12
33	48.337	4.5	1246.527	5.5	83.459	0.6969	0.6673E+12
34	34.555	3.5	1232.801	4.5	83.455	0.4083	0.3910E+12
35	87.506	4.5	1287.224	4.5	83.353	0.1524	0.1463E+12
36	164.709	3.5	1365.945	4.5	83.248	0.1632	0.1571E+12
37	84.559	3.5	1285.922	3.5	83.239	0.1196	0.1152E+12
38	84.559	3.5	1287.224	4.5	83.149	0.2023	0.1952E+12
39	119.227	5.5	1325.063	4.5	82.930	0.1369	0.1328E+12
40	-0.002	1.5	1205.868	2.5	82.928	0.2347	0.2277E+12
41	164.709	2.5	1371.192	2.5	82.886	0.1094	0.1062E+12
42	164.709	3.5	1371.192	2.5	82.886	0.1030	0.1000E+12
43	34.555	3.5	1241.656	3.5	82.843	0.0946	0.9195E+11
44	246.198	2.5	1454.312	3.5	82.774	0.1030	0.1003E+12
45	48.337	4.5	1258.012	5.5	82.667	0.8091	0.7897E+12
46	164.709	3.5	1381.809	4.5	82.163	0.0951	0.9401E+11
47	17.728	2.5	1235.752	3.5	82.100	0.1550	0.1534E+12
48	87.506	4.5	1306.077	5.5	82.063	0.1803	0.1785E+12
49	105.798	1.5	1324.511	2.5	82.054	0.1737	0.1721E+12
50	-0.002	1.5	1221.981	2.5	81.834	0.1395	0.1390E+12

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
51	164.709	2.5	1388.009	3.5	81.746	0.0911	0.9089E+11
52	17.728	2.5	1241.656	3.5	81.704	0.1984	0.1982E+12
53	70.079	0.5	1298.200	0.5	81.425	0.2728	0.2745E+12
54	94.018	2.5	1323.237	3.5	81.353	0.1604	0.1616E+12
55	164.709	2.5	1394.686	3.5	81.302	0.2497	0.2519E+12
56	164.709	3.5	1395.472	4.5	81.250	0.4960	0.5012E+12
57	62.745	1.5	1293.523	2.5	81.249	0.2027	0.2048E+12
58	119.227	5.5	1353.883	6.5	80.994	0.7933	0.8066E+12
59	70.079	0.5	1304.872	1.5	80.985	0.1252	0.1273E+12
60	-0.002	1.5	1235.109	2.5	80.964	0.1537	0.1564E+12
61	94.018	2.5	1331.851	3.5	80.786	0.0837	0.8551E+11
62	62.745	1.5	1300.833	2.5	80.770	0.1045	0.1068E+12
63	119.227	5.5	1358.090	5.5	80.719	0.2424	0.2481E+12
64	48.337	4.5	1287.224	4.5	80.718	0.1577	0.1614E+12
65	48.337	4.5	1287.528	5.5	80.698	0.1075	0.1101E+12
66	148.881	1.5	1389.318	2.5	80.617	0.1262	0.1295E+12
67	94.018	2.5	1336.106	3.5	80.510	0.1159	0.1193E+12
68	62.745	1.5	1304.872	1.5	80.507	0.2322	0.2389E+12
69	87.506	4.5	1331.851	3.5	80.364	0.1210	0.1249E+12
70	164.709	3.5	1410.079	3.5	80.297	0.1378	0.1425E+12
71	247.163	1.5	1493.676	2.5	80.224	0.1686	0.1747E+12
72	119.227	5.5	1365.945	4.5	80.211	0.2452	0.2542E+12
73	112.342	0.5	1362.794	1.5	79.971	0.0951	0.9921E+11
74	34.555	3.5	1285.922	3.5	79.913	0.2839	0.2965E+12
75	130.258	4.5	1381.809	4.5	79.901	0.1666	0.1741E+12
76	105.798	1.5	1357.741	1.5	79.876	0.2799	0.2926E+12
77	34.555	3.5	1287.224	4.5	79.830	1.1236	0.1176E+13
78	119.227	5.5	1372.805	5.5	79.772	0.0893	0.9356E+11
79	62.745	1.5	1317.085	2.5	79.723	0.2665	0.2797E+12
80	246.198	2.5	1503.199	1.5	79.554	0.0856	0.9024E+11
81	48.337	4.5	1306.077	5.5	79.508	0.2005	0.2115E+12
82	119.227	5.5	1382.651	6.5	79.150	0.6873	0.7318E+12
83	131.154	2.5	1394.686	3.5	79.143	0.4340	0.4621E+12
84	130.258	4.5	1395.472	4.5	79.038	0.1373	0.1466E+12
85	-0.002	1.5	1266.990	2.5	78.927	0.1019	0.1091E+12
86	17.728	2.5	1285.922	3.5	78.852	0.6156	0.6604E+12
87	164.709	3.5	1433.076	3.5	78.842	0.1026	0.1101E+12
88	94.018	2.5	1363.104	2.5	78.797	0.0893	0.9590E+11
89	62.745	1.5	1331.969	1.5	78.788	0.3836	0.4121E+12
90	94.018	2.5	1364.020	3.5	78.740	0.7164	0.7707E+12
91	87.506	4.5	1358.090	5.5	78.704	0.5527	0.5951E+12
92	247.163	1.5	1524.543	2.5	78.285	0.0801	0.8720E+11
93	17.728	2.5	1296.019	3.5	78.229	0.2380	0.2594E+12
94	246.198	2.5	1524.543	2.5	78.226	0.0820	0.8938E+11
95	131.154	2.5	1410.079	3.5	78.191	0.7008	0.7646E+12
96	62.745	1.5	1342.882	2.5	78.117	0.3882	0.4243E+12
97	84.559	3.5	1365.945	4.5	78.041	0.1431	0.1567E+12
98	131.154	2.5	1414.584	1.5	77.916	0.1326	0.1457E+12
99	105.798	1.5	1389.318	2.5	77.911	0.1021	0.1122E+12
100	87.506	4.5	1372.805	5.5	77.803	0.1969	0.2169E+12

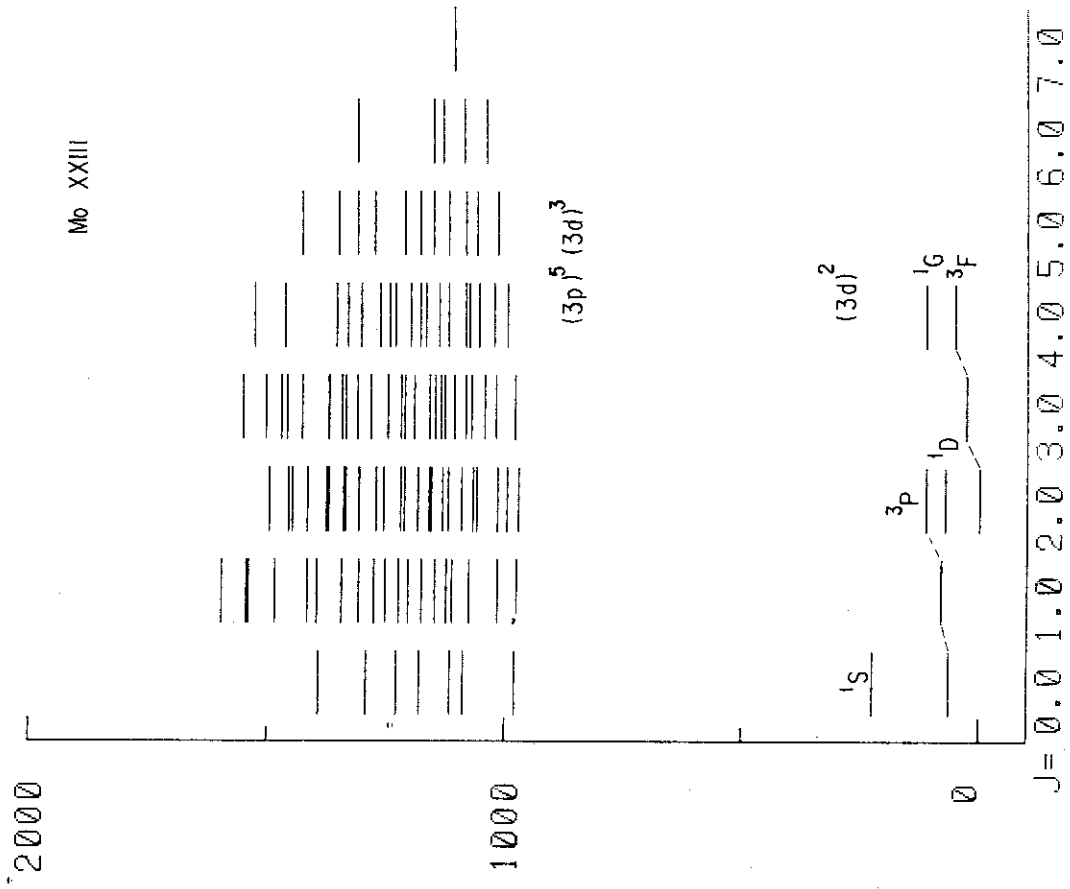
NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
101	164.709	2.5	1451.163	2.5	77.733	0.1189	0.1312E+12
102	-0.002	1.5	1287.267	2.5	77.684	0.1872	0.2069E+12
103	70.079	0.5	1357.741	1.5	77.660	0.0866	0.9580E+11
104	17.728	2.5	1306.654	3.5	77.584	0.1426	0.1580E+12
105	164.709	3.5	1454.312	3.5	77.543	0.2168	0.2405E+12
106	148.881	1.5	1438.514	2.5	77.541	0.1339	0.1485E+12
107	34.555	3.5	1325.063	4.5	77.489	0.3009	0.3342E+12
108	87.506	4.5	1381.809	4.5	77.262	0.1498	0.1674E+12
109	105.798	1.5	1401.387	2.5	77.185	0.5141	0.5755E+12
110	130.258	4.5	1426.591	3.5	77.141	0.1090	0.1222E+12
111	84.559	3.5	1381.809	4.5	77.086	1.2329	0.1384E+13
112	246.198	2.5	1545.304	2.5	76.976	0.0859	0.9674E+11
113	105.798	1.5	1405.973	1.5	76.913	0.1456	0.1641E+12
114	94.018	2.5	1394.686	3.5	76.884	0.1059	0.1194E+12
115	-0.002	1.5	1300.833	2.5	76.874	0.1739	0.1963E+12
116	112.342	0.5	1414.584	1.5	76.791	0.2505	0.2834E+12
117	148.881	1.5	1451.163	2.5	76.788	0.1089	0.1232E+12
118	17.728	2.5	1323.237	3.5	76.598	0.1286	0.1461E+12
119	247.163	1.5	1553.333	1.5	76.560	0.0882	0.1003E+12
120	17.728	2.5	1324.511	2.5	76.524	0.2864	0.3262E+12
121	164.709	3.5	1471.637	4.5	76.515	0.1880	0.2142E+12
122	94.018	2.5	1401.387	2.5	76.490	0.0986	0.1124E+12
123	164.709	2.5	1472.700	2.5	76.453	0.1570	0.1792E+12
124	164.709	3.5	1472.700	2.5	76.453	0.0812	0.9263E+11
125	62.745	1.5	1371.192	2.5	76.427	0.2127	0.2429E+12
126	105.798	1.5	1414.584	1.5	76.407	0.1152	0.1316E+12
127	48.337	4.5	1358.090	5.5	76.350	1.2236	0.1400E+13
128	84.559	3.5	1394.686	3.5	76.329	0.2440	0.2794E+12
129	247.163	1.5	1558.993	2.5	76.229	0.5467	0.6275E+12
130	-0.002	1.5	1311.923	1.5	76.224	1.0904	0.1252E+13
131	94.018	2.5	1405.973	1.5	76.222	0.1645	0.1889E+12
132	164.709	3.5	1478.289	4.5	76.128	0.1804	0.2077E+12
133	17.728	2.5	1331.969	1.5	76.090	0.1307	0.1506E+12
134	34.555	3.5	1349.612	4.5	76.042	0.1058	0.1220E+12
135	48.337	4.5	1364.020	3.5	76.006	0.3202	0.3697E+12
136	246.198	2.5	1563.723	3.5	75.900	0.3685	0.4266E+12
137	94.018	2.5	1414.584	1.5	75.725	0.3215	0.3739E+12
138	148.881	1.5	1472.700	2.5	75.539	0.4064	0.4750E+12
139	17.728	2.5	1342.882	2.5	75.463	0.6242	0.7311E+12
140	84.559	3.5	1410.079	3.5	75.442	0.2306	0.2702E+12
141	164.709	2.5	1493.676	2.5	75.246	0.6414	0.7556E+12
142	112.342	0.5	1442.976	1.5	75.152	0.1312	0.1549E+12
143	34.555	3.5	1365.945	4.5	75.110	0.2269	0.2683E+12
144	-0.002	1.5	1331.969	1.5	75.077	0.2054	0.2431E+12
145	94.018	2.5	1426.591	3.5	75.043	0.1368	0.1620E+12
146	48.337	4.5	1381.809	4.5	74.992	0.1522	0.1805E+12
147	17.728	2.5	1351.693	2.5	74.964	0.0919	0.1091E+12
148	164.709	2.5	1499.424	3.5	74.922	0.4815	0.5721E+12
149	164.709	3.5	1499.569	4.5	74.914	0.7409	0.8806E+12
150	70.079	0.5	1405.973	1.5	74.856	0.1285	0.1530E+12

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
151	112.342	0.5	1450.674	0.5	74.720	0.1154	0.1378E+12
152	164.709	2.5	1503.199	1.5	74.711	0.3789	0.4527E+12
153	48.337	4.5	1388.009	3.5	74.645	0.1145	0.1370E+12
154	130.258	4.5	1471.637	4.5	74.550	0.5497	0.6597E+12
155	131.154	2.5	1472.673	3.5	74.542	0.3163	0.3797E+12
156	131.154	2.5	1472.700	2.5	74.541	0.1993	0.2393E+12
157	164.709	2.5	1507.124	1.5	74.493	0.1829	0.2198E+12
158	62.745	1.5	1405.973	1.5	74.448	0.1067	0.1285E+12
159	247.163	1.5	1591.360	0.5	74.394	0.3917	0.4720E+12
160	94.018	2.5	1438.514	2.5	74.377	0.3065	0.3696E+12
161	87.506	4.5	1432.251	4.5	74.364	0.1049	0.1266E+12
162	112.342	0.5	1457.102	0.5	74.363	0.3089	0.3726E+12
163	148.881	1.5	1493.676	2.5	74.361	0.4305	0.5192E+12
164	17.728	2.5	1363.104	2.5	74.329	0.4676	0.5646E+12
165	105.798	1.5	1451.163	2.5	74.329	0.3360	0.4056E+12
166	48.337	4.5	1395.472	4.5	74.232	0.7189	0.8701E+12
167	84.559	3.5	1433.076	3.5	74.156	0.2379	0.2885E+12
168	94.018	2.5	1442.976	1.5	74.131	0.1257	0.1525E+12
169	-0.002	1.5	1350.085	1.5	74.069	0.2204	0.2680E+12
170	130.258	4.5	1480.963	5.5	74.035	2.0340	0.2475E+13
171	34.555	3.5	1388.009	3.5	73.885	1.2602	0.1540E+13
172	17.728	2.5	1371.192	2.5	73.884	0.2147	0.2624E+12
173	112.342	0.5	1466.607	0.5	73.841	0.1446	0.1769E+12
174	105.798	1.5	1462.367	1.5	73.715	0.1786	0.2192E+12
175	94.018	2.5	1451.163	2.5	73.684	0.4951	0.6082E+12
176	164.709	3.5	1524.543	2.5	73.538	0.1717	0.2118E+12
177	246.198	2.5	1606.323	3.5	73.523	0.1028	0.1269E+12
178	34.555	3.5	1394.686	3.5	73.522	0.1858	0.2292E+12
179	34.555	3.5	1395.472	4.5	73.480	0.1220	0.1508E+12
180	246.198	2.5	1607.107	1.5	73.480	0.1574	0.1945E+12
181	-0.002	1.5	1363.104	2.5	73.362	0.0852	0.1056E+12
182	247.163	1.5	1610.325	2.5	73.359	0.6390	0.7919E+12
183	87.506	4.5	1454.312	3.5	73.163	0.2032	0.2532E+12
184	34.555	3.5	1401.387	2.5	73.162	0.1403	0.1748E+12
185	105.798	1.5	1472.700	2.5	73.158	0.1822	0.2271E+12
186	164.709	3.5	1532.581	3.5	73.106	0.1647	0.2055E+12
187	131.154	2.5	1499.424	3.5	73.085	0.4580	0.5719E+12
188	94.018	2.5	1462.367	1.5	73.081	0.2649	0.3309E+12
189	130.258	4.5	1499.424	3.5	73.037	0.0896	0.1120E+12
190	130.258	4.5	1499.569	4.5	73.029	0.3914	0.4895E+12
191	84.559	3.5	1454.312	3.5	73.006	1.9191	0.2402E+13
192	17.728	2.5	1388.009	3.5	72.978	0.1645	0.2060E+12
193	164.709	2.5	1535.235	1.5	72.965	0.2475	0.3101E+12
194	17.728	2.5	1389.318	2.5	72.908	0.1525	0.1914E+12
195	131.154	2.5	1503.199	1.5	72.884	0.5418	0.6803E+12
196	62.745	1.5	1435.578	0.5	72.842	0.0910	0.1144E+12
197	70.079	0.5	1442.976	1.5	72.839	0.3255	0.4091E+12
198	246.198	2.5	1620.463	3.5	72.766	1.8018	0.2270E+13
199	34.555	3.5	1410.079	3.5	72.700	0.4591	0.5794E+12
200	62.745	1.5	1438.514	2.5	72.687	0.0980	0.1237E+12

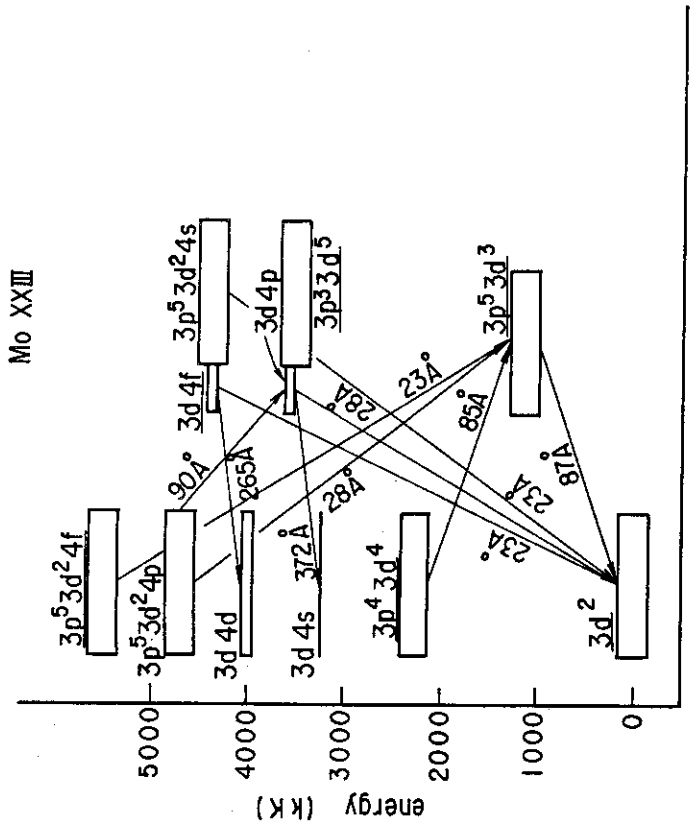
NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
201	246.198	2.5	1623.869	2.5	72.586	0.5192	0.6573E+12
202	94.018	2.5	1472.700	2.5	72.533	0.1980	0.2510E+12
203	164.709	3.5	1545.184	4.5	72.439	0.3574	0.4543E+12
204	164.709	3.5	1545.304	2.5	72.433	0.1096	0.1393E+12
205	17.728	2.5	1401.387	2.5	72.272	0.1399	0.1786E+12
206	48.337	4.5	1432.251	4.5	72.259	2.2754	0.2907E+13
207	112.342	0.5	1496.243	0.5	72.259	0.2454	0.3135E+12
208	87.506	4.5	1471.637	4.5	72.247	0.8458	0.1081E+13
209	87.506	4.5	1472.673	3.5	72.193	0.1055	0.1350E+12
210	148.881	1.5	1535.235	1.5	72.132	0.1457	0.1868E+12
211	70.079	0.5	1457.102	0.5	72.097	0.1528	0.1961E+12
212	34.555	3.5	1422.063	2.5	72.072	0.0817	0.1048E+12
213	105.798	1.5	1493.676	2.5	72.052	0.1232	0.1583E+12
214	84.559	3.5	1472.673	3.5	72.040	0.7833	0.1007E+13
215	84.559	3.5	1472.700	2.5	72.039	0.4644	0.5969E+12
216	62.745	1.5	1451.163	2.5	72.024	0.9082	0.1168E+13
217	87.506	4.5	1478.289	4.5	71.902	3.8639	0.4985E+13
218	112.342	0.5	1503.199	1.5	71.898	0.1651	0.2131E+12
219	34.555	3.5	1426.591	3.5	71.837	0.5163	0.6673E+12
220	70.079	0.5	1462.367	1.5	71.824	0.3910	0.5056E+12
221	17.728	2.5	1410.079	3.5	71.821	0.2402	0.3106E+12
222	87.506	4.5	1480.963	5.5	71.764	0.4562	0.5908E+12
223	84.559	3.5	1478.289	4.5	71.750	0.1611	0.2088E+12
224	164.709	2.5	1558.993	2.5	71.721	0.1146	0.1486E+12
225	164.709	3.5	1558.993	2.5	71.721	0.1602	0.2077E+12
226	62.745	1.5	1457.102	0.5	71.718	0.4640	0.6017E+12
227	112.342	0.5	1507.124	1.5	71.696	0.3133	0.4065E+12
228	148.881	1.5	1545.304	2.5	71.612	0.0801	0.1042E+12
229	70.079	0.5	1466.607	0.5	71.606	0.1568	0.2040E+12
230	105.798	1.5	1503.199	1.5	71.561	0.3326	0.4331E+12
231	34.555	3.5	1432.251	4.5	71.546	0.2629	0.3425E+12
232	164.709	2.5	1563.723	3.5	71.479	0.1030	0.1344E+12
233	164.709	3.5	1563.723	3.5	71.479	1.4818	0.1934E+13
234	164.709	3.5	1566.614	3.5	71.332	0.8345	0.1094E+13
235	164.709	2.5	1566.614	3.5	71.331	0.5761	0.7552E+12
236	164.709	2.5	1567.469	1.5	71.288	0.6363	0.8351E+12
237	62.745	1.5	1466.607	0.5	71.232	0.1227	0.1612E+12
238	34.555	3.5	1438.514	2.5	71.227	0.2379	0.3128E+12
239	131.154	2.5	1535.235	1.5	71.221	0.1806	0.2375E+12
240	148.881	1.5	1554.100	0.5	71.163	0.1932	0.2544E+12
241	94.018	2.5	1499.424	3.5	71.154	0.2257	0.2973E+12
242	48.337	4.5	1454.312	3.5	71.125	0.1078	0.1421E+12
243	148.881	1.5	1556.015	2.5	71.066	0.1213	0.1602E+12
244	17.728	2.5	1426.591	3.5	70.979	0.1032	0.1366E+12
245	84.559	3.5	1493.676	2.5	70.966	0.8992	0.1191E+13
246	94.018	2.5	1503.199	1.5	70.963	0.2521	0.3339E+12
247	148.881	1.5	1558.993	2.5	70.916	0.5558	0.7371E+12
248	148.881	1.5	1560.505	0.5	70.840	0.7382	0.9811E+12
249	87.506	4.5	1499.424	3.5	70.826	0.2720	0.3616E+12
250	87.506	4.5	1499.569	4.5	70.818	0.5404	0.7187E+12

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
251	94.018	2.5	1507.124	1.5	70.766	0.1297	0.1728E+12
252	131.154	2.5	1545.304	2.5	70.714	0.1178	0.1572E+12
253	130.258	4.5	1545.184	4.5	70.675	4.1942	0.5601E+13
254	34.555	3.5	1451.163	2.5	70.591	1.1126	0.1489E+13
255	247.163	1.5	1663.992	1.5	70.580	0.2561	0.3430E+12
256	246.198	2.5	1663.992	1.5	70.532	1.2728	0.1706E+13
257	148.881	1.5	1567.469	1.5	70.493	1.1484	0.1541E+13
258	130.258	4.5	1548.869	5.5	70.491	0.2065	0.2772E+12
259	17.728	2.5	1438.514	2.5	70.384	0.0859	0.1156E+12
260	247.163	1.5	1669.227	2.5	70.320	0.2494	0.3364E+12
261	131.154	2.5	1553.333	1.5	70.315	0.2328	0.3141E+12
262	246.198	2.5	1669.227	2.5	70.273	2.6988	0.3645E+13
263	48.337	4.5	1471.637	4.5	70.259	0.1055	0.1426E+12
264	131.154	2.5	1556.015	2.5	70.182	1.3559	0.1836E+13
265	17.728	2.5	1442.976	1.5	70.163	0.4670	0.6327E+12
266	105.798	1.5	1535.235	1.5	69.958	0.0808	0.1101E+12
267	119.227	5.5	1548.869	5.5	69.948	7.3843	0.1007E+14
268	17.728	2.5	1447.497	1.5	69.941	0.1052	0.1434E+12
269	48.337	4.5	1478.289	4.5	69.932	0.0973	0.1327E+12
270	94.018	2.5	1524.543	2.5	69.904	0.7205	0.9835E+12
271	247.163	1.5	1679.522	0.5	69.815	0.4890	0.6692E+12
272	131.154	2.5	1563.723	3.5	69.805	0.3240	0.4434E+12
273	70.079	0.5	1503.199	1.5	69.778	0.1487	0.2036E+12
274	164.709	3.5	1598.129	4.5	69.763	0.4594	0.6295E+12
275	62.745	1.5	1496.243	0.5	69.759	0.3592	0.4923E+12
276	131.154	2.5	1566.614	3.5	69.664	0.2321	0.3190E+12
277	130.258	4.5	1566.614	3.5	69.621	0.4148	0.5708E+12
278	94.018	2.5	1532.581	3.5	69.514	0.9372	0.1294E+13
279	84.559	3.5	1524.543	2.5	69.445	0.1108	0.1533E+12
280	112.342	0.5	1553.333	1.5	69.397	0.2453	0.3397E+12
281	247.163	1.5	1688.265	1.5	69.391	2.2758	0.3152E+13
282	94.018	2.5	1535.235	1.5	69.386	0.2955	0.4094E+12
283	164.709	2.5	1606.323	3.5	69.367	0.3404	0.4718E+12
284	246.198	2.5	1688.265	1.5	69.345	0.5389	0.7475E+12
285	164.709	2.5	1607.107	1.5	69.329	0.2887	0.4006E+12
286	-0.002	1.5	1442.976	1.5	69.301	0.1152	0.1601E+12
287	62.745	1.5	1507.124	1.5	69.234	0.2351	0.3271E+12
288	17.728	2.5	1462.367	1.5	69.221	0.5442	0.7575E+12
289	87.506	4.5	1532.581	3.5	69.201	0.2428	0.3381E+12
290	164.709	2.5	1610.325	2.5	69.175	1.7728	0.2471E+13
291	164.709	3.5	1610.325	2.5	69.175	0.1180	0.1645E+12
292	105.798	1.5	1553.333	1.5	69.083	0.1678	0.2345E+12
293	105.798	1.5	1554.100	0.5	69.046	1.1314	0.1583E+13
294	105.798	1.5	1556.015	2.5	68.955	0.5042	0.7072E+12
295	-0.002	1.5	1450.674	0.5	68.933	0.0973	0.1366E+12
296	48.337	4.5	1499.569	4.5	68.907	0.6170	0.8667E+12
297	94.018	2.5	1545.304	2.5	68.904	0.9887	0.1389E+13
298	105.798	1.5	1560.505	0.5	68.742	0.2013	0.2841E+12
299	164.709	3.5	1620.463	3.5	68.693	1.1436	0.1617E+13
300	87.506	4.5	1545.184	4.5	68.602	0.1695	0.2403E+12

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
301	148.881	1.5	1607.107	1.5	68.577	0.6308	0.8946E+12
302	164.709	2.5	1623.869	2.5	68.533	0.3871	0.5498E+12
303	164.709	3.5	1623.869	2.5	68.533	1.6142	0.2292E+13
304	84.559	3.5	1545.304	2.5	68.458	0.1656	0.2357E+12
305	87.506	4.5	1548.869	5.5	68.429	0.1245	0.1773E+12
306	94.018	2.5	1556.015	2.5	68.400	0.0889	0.1268E+12
307	34.555	3.5	1499.424	3.5	68.266	0.2094	0.2997E+12
308	34.555	3.5	1499.569	4.5	68.259	0.1451	0.2077E+12
309	70.079	0.5	1535.235	1.5	68.252	0.2244	0.3212E+12
310	-0.002	1.5	1466.607	0.5	68.184	0.8319	0.1194E+13
311	94.018	2.5	1563.723	3.5	68.041	0.1620	0.2334E+12
312	84.559	3.5	1556.015	2.5	67.960	0.1743	0.2517E+12
313	62.745	1.5	1535.235	1.5	67.912	0.2688	0.3888E+12
314	84.559	3.5	1558.993	2.5	67.823	0.2963	0.4296E+12
315	131.154	2.5	1607.107	1.5	67.753	1.3589	0.1974E+13
316	130.258	4.5	1606.323	3.5	67.748	3.5886	0.5215E+13
317	87.506	4.5	1563.723	3.5	67.741	0.8039	0.1169E+13
318	119.227	5.5	1598.129	4.5	67.618	6.9597	0.1015E+14
319	87.506	4.5	1566.614	3.5	67.608	2.2147	0.3232E+13
320	84.559	3.5	1566.614	3.5	67.474	0.6725	0.9852E+12
321	48.337	4.5	1532.581	3.5	67.374	4.3781	0.6433E+13
322	17.728	2.5	1507.124	1.5	67.141	1.0108	0.1495E+13
323	34.555	3.5	1524.543	2.5	67.115	1.4775	0.2188E+13
324	130.258	4.5	1620.463	3.5	67.105	1.6346	0.2421E+13
325	131.154	2.5	1623.869	2.5	66.992	0.3172	0.4714E+12
326	112.342	0.5	1607.107	1.5	66.900	0.1697	0.2530E+12
327	-0.002	1.5	1496.243	0.5	66.834	0.5040	0.7526E+12
328	34.555	3.5	1532.581	3.5	66.755	0.2919	0.4369E+12
329	164.709	2.5	1663.992	1.5	66.699	0.2096	0.3142E+12
330	164.709	3.5	1669.227	2.5	66.467	1.5173	0.2291E+13
331	164.709	2.5	1669.227	2.5	66.466	0.1863	0.2813E+12
332	17.728	2.5	1524.543	2.5	66.365	0.1637	0.2479E+12
333	-0.002	1.5	1507.124	1.5	66.351	0.1520	0.2302E+12
334	34.555	3.5	1545.304	2.5	66.192	0.6624	0.1008E+13
335	148.881	1.5	1663.992	1.5	66.002	0.0946	0.1448E+12
336	48.337	4.5	1563.723	3.5	65.990	0.2692	0.4122E+12
337	17.728	2.5	1535.235	1.5	65.898	0.2458	0.3776E+12
338	87.506	4.5	1606.323	3.5	65.841	1.0493	0.1614E+13
339	164.709	2.5	1688.265	1.5	65.636	0.3901	0.6040E+12
340	34.555	3.5	1558.993	2.5	65.598	0.0914	0.1416E+12
341	84.559	3.5	1610.325	2.5	65.541	2.0027	0.3110E+13
342	17.728	2.5	1545.304	2.5	65.463	0.1588	0.2471E+12
343	87.506	4.5	1620.463	3.5	65.233	0.6425	0.1007E+13
344	131.154	2.5	1669.227	2.5	65.016	0.1973	0.3114E+12
345	48.337	4.5	1620.463	3.5	63.608	0.2113	0.3483E+12



Mo XXIII エネルギー・レベル
$(3d)^2$, $(3p)^5(3d)^3$



Mo XXIII グロトリアン・ダイアグラム

Mo XXIII　エネルギー レベル

EVEN　$(3d)^2$

ODD　$(3p)^5\ (3d)^3$

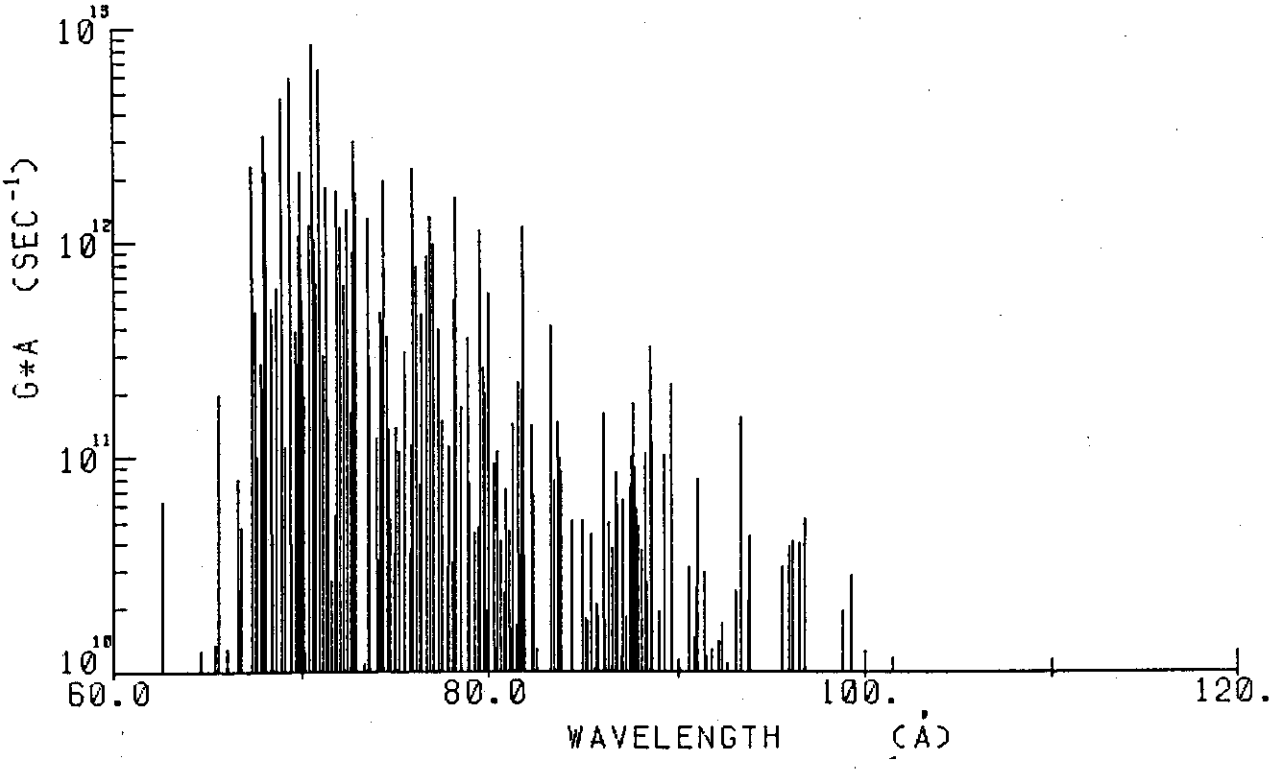
EVEN PARITY

J	NO	ENERGY(KK)		LEADING PERCENTAGES				
0.0	1	67.182	---	1	3P 94.3%	1	1S	5.7%
0.0	2	224.597	---	1	1S 94.3%	1	3P	5.7%
1.0	1	83.570	---	1	3P100.0%			
2.0	1	0.001	---	1	3F 91.7%	1	1D	7.9%
2.0	2	72.894	---	1	1D 54.5%	1	3P	38.8%
2.0	3	115.390	---	1	3P 60.8%	1	1D	37.5%
3.0	1	29.106	---	1	3F100.0%			
4.0	1	54.744	---	1	3F 92.9%	1	1G	7.1%
4.0	2	112.588	---	1	1G 92.9%	1	3F	7.1%

ODD J	PARITY NO	ENERGY(KK)		LEADING PERCENTAGES	
0.0	1	983.258	---	1 (4F) 5D 87.3%	1 (4P) 5D 8.4%
0.0	2	1088.432	---	1 (2D) 3P 28.4%	1 (2P) 1S 27.4%
0.0	3	1119.441	---	1 (2P) 3P 32.8%	1 (2D) 3P 24.0%
0.0	4	1183.030	---	1 (2D) 3P 28.5%	1 (4P) 5D 25.0%
0.0	5	1229.909	---	1 (4P) 5D 42.8%	1 (2D) 3P 30.0%
0.0	6	1294.989	---	1 (2P) 3P 52.3%	1 (2P) 1S 29.6%
0.0	7	1392.230	---	1 (4P) 3P 51.8%	1 (2D) 3P 30.2%
1.0	1	976.366	---	1 (4F) 5D 55.2%	1 (4F) 5F 26.6%
1.0	2	1019.299	---	1 (4F) 5F 40.4%	1 (4F) 5D 25.8%
1.0	3	1076.722	---	1 (2P) 3P 29.4%	1 (2P) 3S 18.0%
1.0	4	1115.523	---	1 (2D) 3P 22.6%	1 (4P) 3P 20.8%
1.0	5	1125.277	---	1 (4F) 5F 19.1%	1 (2D) 3D 18.2%
1.0	6	1149.922	---	1 (4P) 3D 43.3%	1 (2F) 3D 17.8%
1.0	7	1176.802	---	1 (2F) 3D 15.1%	1 (2P) 3S 13.6%
1.0	8	1207.634	---	1 (4P) 5P 24.5%	1 (2D) 1P 17.4%
1.0	9	1225.155	---	1 (2D) 3P 58.0%	1 (4P) 5D 11.7%
1.0	10	1252.194	---	1 (2P) 3D 32.8%	1 (4P) 5P 21.8%
1.0	11	1277.926	---	1 (2P) 3D 21.6%	1 (4P) 5D 17.6%
1.0	12	1310.680	---	1 (2P) 3P 18.6%	1 (2P) 3S 18.0%
1.0	13	1347.661	---	1 (4P) 3D 21.5%	1 (2D) 3D 15.4%
1.0	14	1397.293	---	1 (4P) 3P 38.2%	1 (2D) 3D 18.8%
1.0	15	1417.325	---	1 (2D) 3D 22.5%	1 (2D) 3D 21.8%
1.0	16	1484.321	---	1 (4F) 3D 53.1%	1 (2D) 3D 11.9%
1.0	17	1541.124	---	1 (2P) 1P 40.2%	1 (2D) 1P 19.5%
1.0	18	1545.730	---	1 (4P) 3S 52.6%	1 (2P) 3S 11.4%
1.0	19	1596.967	---	1 (2D) 1P 78.3%	1 (2D) 3D 8.6%
2.0	1	974.027	---	1 (4F) 5F 40.5%	1 (4F) 5D 34.3%
2.0	2	997.153	---	1 (4P) 5S 79.6%	1 (4P) 5P 9.3%
2.0	3	1017.293	---	1 (4F) 5D 26.6%	1 (2G) 3F 16.7%
2.0	4	1060.285	---	1 (2G) 3F 24.9%	1 (2D) 3D 12.9%
2.0	5	1068.750	---	1 (4F) 5F 25.1%	1 (2P) 3P 22.4%
2.0	6	1095.184	---	1 (2P) 3D 32.9%	1 (2P) 3P 15.7%
2.0	7	1120.238	---	1 (4F) 5G 50.3%	1 (2G) 3F 25.1%
2.0	8	1134.270	---	1 (4P) 5P 29.4%	1 (4P) 3P 16.3%
2.0	9	1157.988	---	1 (2F) 3D 18.0%	1 (4F) 5F 15.0%
2.0	10	1163.381	---	1 (2F) 3F 17.9%	1 (2F) 1D 17.4%
2.0	11	1185.065	---	1 (2P) 1D 25.6%	1 (4P) 5D 16.1%
2.0	12	1214.523	---	1 (2D) 3P 13.7%	1 (2F) 3F 11.1%
2.0	13	1222.279	---	1 (2F) 3F 15.9%	1 (4P) 5P 15.6%
2.0	14	1258.322	---	1 (4P) 5P 25.4%	1 (2D) 1D 13.4%
2.0	15	1273.049	---	1 (2D) 3F 24.9%	1 (2D) 3D 16.1%
2.0	16	1309.929	---	1 (2D) 3D 24.7%	1 (2D) 3F 16.1%
2.0	17	1338.493	---	1 (2D) 3F 17.6%	1 (2P) 1D 15.6%
2.0	18	1340.308	---	1 (2P) 1D 18.6%	1 (2D) 1D 14.7%
2.0	19	1373.624	---	1 (4F) 3F 48.7%	1 (2G) 3F 13.4%
2.0	20	1376.997	---	1 (4P) 3D 20.4%	1 (2D) 1D 20.4%
2.0	21	1417.280	---	1 (4P) 3P 27.8%	1 (2F) 3F 12.4%
2.0	22	1450.773	---	1 (2D) 3F 29.5%	1 (2D) 1D 24.7%
2.0	23	1457.479	---	1 (2D) 3D 36.3%	1 (2D) 1D 13.1%

ODD J	PARITY NO	ENERGY(KK)		LEADING PERCENTAGES	
2.0	24	1497.137	---	1 (2D) 3P 25.1%	1 (4P) 3P 19.3%
2.0	25	1499.278	---	1 (4F) 3D 48.6%	1 (2P) 3D 11.1%
3.0	1	982.617	---	1 (4F) 5F 49.1%	1 (4F) 5D 27.0%
3.0	2	1020.350	---	1 (4P) 5D 19.7%	1 (4F) 5G 19.6%
3.0	3	1045.622	---	1 (4F) 3G 34.3%	1 (2H) 3G 19.3%
3.0	4	1073.770	---	1 (4P) 5D 23.5%	1 (2G) 3F 13.9%
3.0	5	1084.954	---	1 (2P) 3D 20.6%	1 (2D) 3D 18.5%
3.0	6	1108.986	---	1 (2D) 3D 25.8%	1 (2D) 3F 15.9%
3.0	7	1131.781	---	1 (4P) 5P 62.5%	1 (4P) 3D 7.8%
3.0	8	1139.173	---	1 (2F) 3F 29.5%	1 (2F) 3G 11.1%
3.0	9	1148.787	---	1 (2P) 3D 18.3%	1 (2G) 3F 16.4%
3.0	10	1161.352	---	1 (4F) 5G 28.1%	1 (2P) 3D 11.6%
3.0	11	1195.005	---	1 (4F) 5D 24.0%	1 (4P) 5D 18.9%
3.0	12	1215.434	---	1 (2D) 3F 23.7%	1 (2G) 3G 20.3%
3.0	13	1221.646	---	1 (4F) 3G 19.2%	1 (2G) 3G 13.2%
3.0	14	1250.241	---	1 (2H) 3G 14.4%	1 (2F) 3D 12.2%
3.0	15	1286.451	---	1 (2D) 3F 20.4%	1 (2D) 3F 16.4%
3.0	16	1313.461	---	1 (2D) 3F 22.4%	1 (2D) 1F 22.3%
3.0	17	1339.173	---	1 (2F) 3G 35.8%	1 (2F) 3F 9.7%
3.0	18	1346.392	---	1 (2D) 3D 28.2%	1 (2D) 3D 18.8%
3.0	19	1374.505	---	1 (4F) 3F 30.5%	1 (2F) 3D 14.6%
3.0	20	1431.713	---	1 (4F) 3F 18.4%	1 (4P) 3D 16.4%
3.0	21	1461.232	---	1 (2G) 1F 32.0%	1 (2D) 1F 19.4%
3.0	22	1475.560	---	1 (2F) 3D 20.7%	1 (2D) 3D 15.3%
3.0	23	1506.684	---	1 (4F) 3D 45.1%	1 (4P) 3D 13.2%
3.0	24	1554.210	---	1 (2F) 1F 32.5%	1 (2D) 1F 21.5%
4.0	1	996.154	---	1 (4F) 5F 51.9%	1 (4F) 5D 17.2%
4.0	2	1025.308	---	1 (4P) 5D 34.4%	1 (4F) 5G 21.9%
4.0	3	1056.199	---	1 (4F) 3G 27.4%	1 (2H) 3G 15.0%
4.0	4	1079.126	---	1 (4P) 5D 32.9%	1 (2G) 3F 12.3%
4.0	5	1086.261	---	1 (2G) 1G 25.2%	1 (2G) 3G 17.0%
4.0	6	1122.277	---	1 (2D) 3F 49.5%	1 (2F) 3F 23.2%
4.0	7	1143.777	---	1 (2D) 3F 23.6%	1 (2H) 3H 22.6%
4.0	8	1169.544	---	1 (2G) 3H 22.1%	1 (2F) 3G 14.3%
4.0	9	1182.147	---	1 (2D) 3F 30.5%	1 (2H) 3G 12.3%
4.0	10	1203.172	---	1 (4F) 5D 28.7%	1 (2F) 3F 23.3%
4.0	11	1232.115	---	1 (2F) 3G 21.5%	1 (4F) 5D 15.7%
4.0	12	1244.107	---	1 (2D) 3F 31.8%	1 (2H) 3H 24.6%
4.0	13	1264.428	---	1 (2G) 3H 35.1%	1 (4F) 3G 23.7%
4.0	14	1307.279	---	1 (2G) 3G 27.0%	1 (2H) 3G 22.0%
4.0	15	1333.074	---	1 (2H) 3G 21.7%	1 (2H) 3H 14.2%
4.0	16	1359.046	---	1 (2F) 1G 28.3%	1 (2F) 3G 24.7%
4.0	17	1464.553	---	1 (4F) 3F 57.2%	1 (2G) 3F 25.1%
4.0	18	1530.071	---	1 (2H) 1G 48.2%	1 (2G) 1G 29.4%
5.0	1	1017.381	---	1 (4F) 5F 52.6%	1 (4F) 5G 41.1%
5.0	2	1063.728	---	1 (4F) 5F 33.9%	1 (4F) 5G 33.0%
5.0	3	1084.551	---	1 (2G) 3H 26.2%	1 (2G) 3G 26.0%
5.0	4	1120.006	---	1 (2G) 3H 36.1%	1 (2G) 1H 34.5%
5.0	5	1153.047	---	1 (2F) 3G 37.1%	1 (2H) 3I 33.1%

ODD J	PARITY NO	ENERGY(KK)		LEADING PERCENTAGES	
5.0	6	1183.589	---	1 (2G) 3G 35.2%	1 (2G) 1H 19.8%
5.0	7	1215.930	---	1 (2F) 3G 21.1%	1 (2H) 3I 20.6%
5.0	8	1277.625	---	1 (4F) 3G 39.5%	1 (2H) 3H 24.9%
5.0	9	1312.319	---	1 (2G) 1H 26.4%	1 (2G) 3G 23.5%
5.0	10	1353.084	---	1 (4F) 3G 22.6%	1 (2H) 3G 18.9%
5.0	11	1430.281	---	1 (2H) 1H 53.7%	1 (2H) 3G 31.3%
6.0	1	1041.030	---	1 (4F) 5G 82.6%	1 (2G) 3H 15.4%
6.0	2	1089.243	---	1 (2G) 3H 36.2%	1 (2H) 3I 33.5%
6.0	3	1134.469	---	1 (2G) 3H 48.2%	1 (2H) 3I 34.9%
6.0	4	1155.911	---	1 (2H) 3H 59.2%	1 (2H) 1I 38.4%
6.0	5	1314.872	---	1 (2H) 1I 36.8%	1 (2H) 3H 35.1%
7.0	1	1110.269	---	1 (2H) 3I100.0%	



Mo XXIII　スペクトル・パターン
$(3d)^2 - (3p)^5 (3d)^3$

Mo XXIII　波長，振動子強度

$(3d)^2 - (3p)^5\,(3d)^3$

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
1	54.744	4.0	1025.308	4.0	103.033	0.0043	0.2726E+10
2	112.588	4.0	1084.551	5.0	102.885	0.0089	0.5614E+10
3	83.570	1.0	1068.750	2.0	101.504	0.0181	0.1172E+11
4	115.390	2.0	1108.985	3.0	100.645	0.0129	0.8486E+10
5	112.588	4.0	1120.005	5.0	99.264	0.0415	0.2811E+11
6	67.182	0.0	1076.721	1.0	99.055	0.0108	0.7317E+10
7	83.570	1.0	1095.183	2.0	98.852	0.0280	0.1913E+11
8	72.894	2.0	1084.954	3.0	98.808	0.0144	0.9839E+10
9	0.001	2.0	1019.298	1.0	98.107	0.0059	0.4073E+10
10	112.588	4.0	1139.172	3.0	97.410	0.0057	0.4016E+10
11	224.597	0.0	1252.194	1.0	97.314	0.0064	0.4518E+10
12	54.744	4.0	1084.551	5.0	97.106	0.0049	0.3456E+10
13	112.588	4.0	1143.776	4.0	96.975	0.0120	0.8542E+10
14	115.390	2.0	1148.787	3.0	96.768	0.0733	0.5223E+11
15	72.894	2.0	1108.985	3.0	96.517	0.0559	0.4000E+11
16	112.588	4.0	1153.046	5.0	96.111	0.0562	0.4059E+11
17	83.570	1.0	1125.276	1.0	95.996	0.0129	0.9330E+10
18	115.390	2.0	1157.988	2.0	95.914	0.0533	0.3865E+11
19	0.001	2.0	1045.622	3.0	95.637	0.0124	0.9062E+10
20	115.390	2.0	1161.352	3.0	95.606	0.0429	0.3131E+11
21	224.597	0.0	1277.925	1.0	94.937	0.0105	0.7789E+10
22	112.588	4.0	1169.544	4.0	94.611	0.0074	0.5500E+10
23	29.106	3.0	1086.260	4.0	94.594	0.0090	0.6740E+10
24	72.894	2.0	1131.781	3.0	94.439	0.0087	0.6526E+10
25	54.744	4.0	1120.005	5.0	93.874	0.0568	0.4297E+11
26	72.894	2.0	1139.172	3.0	93.784	0.0281	0.2132E+11
27	115.390	2.0	1185.064	2.0	93.487	0.0093	0.7062E+10
28	112.588	4.0	1183.588	5.0	93.371	0.2010	0.1538E+12
29	83.570	1.0	1157.988	2.0	93.074	0.0312	0.2404E+11
30	29.106	3.0	1108.985	3.0	92.603	0.0142	0.1104E+11
31	112.588	4.0	1195.005	3.0	92.386	0.0098	0.7635E+10
32	67.182	0.0	1149.921	1.0	92.358	0.0215	0.1683E+11
33	72.894	2.0	1157.988	2.0	92.158	0.0178	0.1401E+11
34	224.597	0.0	1310.679	1.0	92.074	0.0065	0.5091E+10
35	54.744	4.0	1143.776	4.0	91.825	0.0161	0.1276E+11
36	72.894	2.0	1163.381	2.0	91.702	0.0093	0.7341E+10
37	115.390	2.0	1207.634	1.0	91.555	0.0151	0.1199E+11
38	83.570	1.0	1176.801	1.0	91.472	0.0370	0.2952E+11
39	54.744	4.0	1153.046	5.0	91.050	0.0985	0.7924E+11
40	115.390	2.0	1214.523	2.0	90.981	0.0308	0.2478E+11
41	115.390	2.0	1215.434	3.0	90.906	0.0180	0.1454E+11
42	112.588	4.0	1215.930	5.0	90.634	0.0382	0.3101E+11
43	72.894	2.0	1176.801	1.0	90.587	0.0287	0.2333E+11
44	29.106	3.0	1134.270	2.0	90.484	0.0105	0.8546E+10
45	54.744	4.0	1161.352	3.0	90.366	0.0106	0.8661E+10
46	115.390	2.0	1222.279	2.0	90.343	0.0048	0.3918E+10
47	0.001	2.0	1108.985	3.0	90.173	0.0048	0.3922E+10
48	67.182	0.0	1176.801	1.0	90.121	0.0128	0.1048E+11
49	115.390	2.0	1225.155	1.0	90.109	0.0061	0.5017E+10
50	72.894	2.0	1185.064	2.0	89.914	0.0041	0.3389E+10

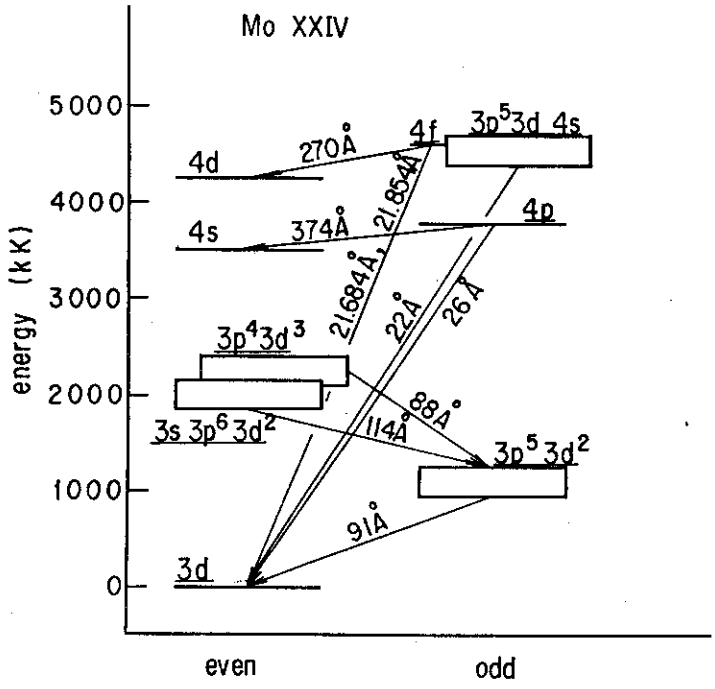
NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
51	29.106	3.0	1143.776	4.0	89.713	0.2665	0.2208E+12
52	54.744	4.0	1169.544	4.0	89.702	0.0916	0.7595E+11
53	112.588	4.0	1232.114	4.0	89.324	0.1193	0.9970E+11
54	29.106	3.0	1148.787	3.0	89.311	0.0631	0.5274E+11
55	0.001	2.0	1120.237	2.0	89.267	0.1226	0.1026E+12
56	224.597	0.0	1347.661	1.0	89.042	0.0228	0.1914E+11
57	0.001	2.0	1125.276	1.0	88.867	0.0075	0.6359E+10
58	54.744	4.0	1182.147	4.0	88.699	0.1391	0.1180E+12
59	54.744	4.0	1183.588	5.0	88.586	0.3879	0.3297E+12
60	29.106	3.0	1157.988	2.0	88.583	0.0050	0.4219E+10
61	83.570	1.0	1214.523	2.0	88.421	0.0170	0.1448E+11
62	112.588	4.0	1244.106	4.0	88.377	0.0308	0.2630E+11
63	29.106	3.0	1161.352	3.0	88.320	0.1226	0.1048E+12
64	72.894	2.0	1207.634	1.0	88.126	0.0434	0.3729E+11
65	115.390	2.0	1252.194	1.0	87.966	0.0565	0.4873E+11
66	112.588	4.0	1250.241	3.0	87.900	0.0112	0.9628E+10
67	83.570	1.0	1222.279	2.0	87.819	0.0672	0.5814E+11
68	0.001	2.0	1139.172	3.0	87.783	0.1046	0.9052E+11
69	54.744	4.0	1195.005	3.0	87.699	0.0953	0.8262E+11
70	29.106	3.0	1169.544	4.0	87.686	0.2044	0.1773E+12
71	67.182	0.0	1207.634	1.0	87.685	0.0057	0.4917E+10
72	83.570	1.0	1225.155	1.0	87.598	0.0276	0.2397E+11
73	72.894	2.0	1214.523	2.0	87.594	0.1159	0.1007E+12
74	72.894	2.0	1215.434	3.0	87.524	0.0135	0.1177E+11
75	115.390	2.0	1258.322	2.0	87.494	0.0825	0.7192E+11
76	83.570	1.0	1229.908	0.0	87.234	0.0208	0.1825E+11
77	54.744	4.0	1203.172	4.0	87.076	0.0715	0.6293E+11
78	72.894	2.0	1221.645	3.0	87.051	0.0727	0.6402E+11
79	0.001	2.0	1148.787	3.0	87.048	0.0501	0.4413E+11
80	0.001	2.0	1149.921	1.0	86.963	0.0135	0.1190E+11
81	112.588	4.0	1264.428	4.0	86.818	0.0675	0.5972E+11
82	72.894	2.0	1225.155	1.0	86.786	0.0103	0.9151E+10
83	29.106	3.0	1182.147	4.0	86.727	0.0968	0.8580E+11
84	29.106	3.0	1185.064	2.0	86.508	0.0428	0.3814E+11
85	115.390	2.0	1273.049	2.0	86.381	0.0558	0.4985E+11
86	54.744	4.0	1215.434	3.0	86.156	0.0193	0.1739E+11
87	54.744	4.0	1215.930	5.0	86.119	0.1772	0.1594E+12
88	0.001	2.0	1161.352	3.0	86.107	0.1584	0.1425E+12
89	112.588	4.0	1277.624	5.0	85.834	0.0200	0.1809E+11
90	54.744	4.0	1221.645	3.0	85.697	0.0226	0.2056E+11
91	83.570	1.0	1252.194	1.0	85.571	0.0116	0.1054E+11
92	115.390	2.0	1286.450	3.0	85.393	0.0482	0.4413E+11
93	224.597	0.0	1397.292	1.0	85.274	0.0188	0.1723E+11
94	112.588	4.0	1286.450	3.0	85.189	0.0091	0.8333E+10
95	29.106	3.0	1203.172	4.0	85.174	0.0194	0.1781E+11
96	83.570	1.0	1258.322	2.0	85.124	0.0052	0.4813E+10
97	0.001	2.0	1176.801	1.0	84.976	0.0209	0.1927E+11
98	72.894	2.0	1250.241	3.0	84.937	0.0555	0.5128E+11
99	54.744	4.0	1232.114	4.0	84.935	0.0157	0.1453E+11
100	67.182	0.0	1252.194	1.0	84.387	0.0546	0.5116E+11

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
101	72.894	2.0	1258.322	2.0	84.358	0.0067	0.6263E+10
102	29.106	3.0	1214.523	2.0	84.358	0.0058	0.5413E+10
103	83.570	1.0	1273.049	2.0	84.070	0.0058	0.5501E+10
104	29.106	3.0	1221.645	3.0	83.855	0.0142	0.1345E+11
105	224.597	0.0	1417.325	1.0	83.841	0.0899	0.8529E+11
106	29.106	3.0	1222.279	2.0	83.810	0.1052	0.9991E+11
107	83.570	1.0	1277.925	1.0	83.727	0.0233	0.2214E+11
108	115.390	2.0	1309.929	2.0	83.714	0.0254	0.2415E+11
109	112.588	4.0	1307.279	4.0	83.704	0.0783	0.7453E+11
110	0.001	2.0	1195.005	3.0	83.682	0.0269	0.2565E+11
111	115.390	2.0	1310.679	1.0	83.662	0.0058	0.5573E+10
112	54.744	4.0	1250.241	3.0	83.647	0.1521	0.1450E+12
113	115.390	2.0	1313.460	3.0	83.468	0.0816	0.7817E+11
114	112.588	4.0	1312.318	5.0	83.352	0.4227	0.4058E+12
115	29.106	3.0	1232.114	4.0	83.125	0.0079	0.7670E+10
116	67.182	0.0	1277.925	1.0	82.594	0.0131	0.1277E+11
117	83.570	1.0	1294.988	0.0	82.548	0.0080	0.7809E+10
118	72.894	2.0	1286.450	3.0	82.402	0.0690	0.6777E+11
119	0.001	2.0	1214.523	2.0	82.337	0.0058	0.5705E+10
120	29.106	3.0	1244.106	4.0	82.305	0.1420	0.1398E+12
121	0.001	2.0	1215.434	3.0	82.275	0.0048	0.4680E+10
122	112.588	4.0	1333.073	4.0	81.935	0.0349	0.3467E+11
123	0.001	2.0	1221.645	3.0	81.857	1.1988	0.1193E+13
124	0.001	2.0	1222.279	2.0	81.815	0.0177	0.1762E+11
125	54.744	4.0	1277.624	5.0	81.774	0.2068	0.2063E+12
126	0.001	2.0	1225.155	1.0	81.622	0.0356	0.3560E+11
127	112.588	4.0	1339.173	3.0	81.527	0.2212	0.2220E+12
128	83.570	1.0	1310.679	1.0	81.492	0.0164	0.1652E+11
129	115.390	2.0	1346.392	3.0	81.235	0.1422	0.1437E+12
130	54.744	4.0	1286.450	3.0	81.188	0.0082	0.8268E+10
131	115.390	2.0	1347.661	1.0	81.151	0.0157	0.1592E+11
132	112.588	4.0	1346.392	3.0	81.050	0.0448	0.4550E+11
133	29.106	3.0	1264.428	4.0	80.951	0.0694	0.7059E+11
134	72.894	2.0	1310.679	1.0	80.789	0.0232	0.2372E+11
135	112.588	4.0	1353.084	5.0	80.613	0.0339	0.3477E+11
136	72.894	2.0	1313.460	3.0	80.608	0.0401	0.4114E+11
137	67.182	0.0	1310.679	1.0	80.418	0.1037	0.1069E+12
138	29.106	3.0	1273.049	2.0	80.390	0.0125	0.1292E+11
139	112.588	4.0	1359.045	4.0	80.227	0.0908	0.9407E+11
140	0.001	2.0	1250.241	3.0	79.985	0.5600	0.5838E+12
141	0.001	2.0	1252.194	1.0	79.860	0.0183	0.1910E+11
142	54.744	4.0	1307.279	4.0	79.838	0.1924	0.2013E+12
143	83.570	1.0	1338.492	2.0	79.686	0.2516	0.2642E+12
144	29.106	3.0	1286.450	3.0	79.533	0.0050	0.5269E+10
145	54.744	4.0	1312.318	5.0	79.518	1.0878	0.1147E+13
146	115.390	2.0	1373.623	2.0	79.477	0.0062	0.6513E+10
147	115.390	2.0	1374.505	3.0	79.421	0.0450	0.4755E+11
148	115.390	2.0	1376.996	2.0	79.264	0.0425	0.4507E+11
149	112.588	4.0	1374.505	3.0	79.245	0.0168	0.1784E+11
150	72.894	2.0	1338.492	2.0	79.014	0.0709	0.7569E+11

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
151	72.894	2.0	1340.307	2.0	78.901	0.3346	0.3585E+12
152	72.894	2.0	1346.392	3.0	78.524	0.1592	0.1722E+12
153	29.106	3.0	1307.279	4.0	78.237	1.4817	0.1615E+13
154	67.182	0.0	1347.661	1.0	78.096	0.4909	0.5369E+12
155	29.106	3.0	1309.929	2.0	78.075	0.0081	0.8849E+10
156	115.390	2.0	1397.292	1.0	78.009	0.0300	0.3286E+11
157	29.106	3.0	1313.460	3.0	77.860	0.1023	0.1126E+12
158	0.001	2.0	1286.450	3.0	77.733	0.0280	0.3089E+11
159	83.570	1.0	1373.623	2.0	77.516	0.1334	0.1481E+12
160	83.570	1.0	1376.996	2.0	77.314	0.3506	0.3912E+12
161	54.744	4.0	1353.084	5.0	77.021	0.8783	0.9875E+12
162	72.894	2.0	1373.623	2.0	76.880	0.0075	0.8470E+10
163	72.894	2.0	1374.505	3.0	76.828	1.1769	0.1330E+13
164	115.390	2.0	1417.280	2.0	76.811	0.1342	0.1517E+12
165	115.390	2.0	1417.325	1.0	76.809	0.0153	0.1733E+11
166	29.106	3.0	1333.073	4.0	76.689	0.4437	0.5031E+12
167	72.894	2.0	1376.996	2.0	76.681	0.7657	0.8686E+12
168	54.744	4.0	1359.045	4.0	76.669	0.0675	0.7663E+11
169	83.570	1.0	1392.230	0.0	76.414	0.4078	0.4658E+12
170	29.106	3.0	1338.492	2.0	76.372	0.0246	0.2818E+11
171	0.001	2.0	1309.929	2.0	76.340	0.0118	0.1346E+11
172	29.106	3.0	1339.173	3.0	76.332	0.0651	0.7449E+11
173	0.001	2.0	1310.679	1.0	76.296	0.0564	0.6463E+11
174	0.001	2.0	1313.460	3.0	76.135	0.0117	0.1341E+11
175	83.570	1.0	1397.292	1.0	76.120	0.6813	0.7842E+12
176	115.390	2.0	1431.712	3.0	75.969	0.0306	0.3538E+11
177	224.597	0.0	1541.124	1.0	75.957	0.0054	0.6197E+10
178	112.588	4.0	1430.280	5.0	75.890	1.9343	0.2240E+13
179	112.588	4.0	1431.712	3.0	75.808	0.0994	0.1154E+12
180	54.744	4.0	1374.505	3.0	75.771	0.0309	0.3591E+11
181	224.597	0.0	1545.730	1.0	75.693	0.0257	0.2996E+11
182	72.894	2.0	1397.292	1.0	75.506	0.2632	0.3080E+12
183	29.106	3.0	1359.045	4.0	75.191	0.0912	0.1076E+12
184	67.182	0.0	1397.292	1.0	75.182	0.0538	0.6343E+11
185	83.570	1.0	1417.280	2.0	74.979	0.0503	0.5964E+11
186	83.570	1.0	1417.325	1.0	74.976	0.1154	0.1369E+12
187	115.390	2.0	1450.773	2.0	74.885	0.0304	0.3620E+11
188	0.001	2.0	1338.492	2.0	74.711	0.0439	0.5248E+11
189	0.001	2.0	1339.173	3.0	74.673	0.1142	0.1366E+12
190	0.001	2.0	1340.307	2.0	74.610	0.0557	0.6669E+11
191	115.390	2.0	1457.478	2.0	74.511	0.3078	0.3698E+12
192	72.894	2.0	1417.280	2.0	74.383	0.6538	0.7881E+12
193	72.894	2.0	1417.325	1.0	74.381	0.0575	0.6931E+11
194	29.106	3.0	1373.623	2.0	74.376	0.2013	0.2427E+12
195	29.106	3.0	1374.505	3.0	74.327	1.6076	0.1941E+13
196	115.390	2.0	1461.231	3.0	74.303	0.3607	0.4358E+12
197	0.001	2.0	1347.661	1.0	74.203	0.3892	0.4715E+12
198	29.106	3.0	1376.996	2.0	74.190	0.2528	0.3063E+12
199	112.588	4.0	1461.231	3.0	74.149	0.0170	0.2057E+11
200	67.182	0.0	1417.325	1.0	74.066	0.0274	0.3333E+11

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
201	112.588	4.0	1464.553	4.0	73.966	0.1021	0.1245E+12
202	72.894	2.0	1431.712	3.0	73.593	0.2142	0.2637E+12
203	115.390	2.0	1475.559	3.0	73.520	1.0561	0.1303E+13
204	112.588	4.0	1475.559	3.0	73.369	0.0089	0.1099E+11
205	224.597	0.0	1596.967	1.0	72.867	1.3778	0.1731E+13
206	0.001	2.0	1373.623	2.0	72.800	2.3629	0.2974E+13
207	83.570	1.0	1457.478	2.0	72.785	0.1815	0.2286E+12
208	0.001	2.0	1374.505	3.0	72.754	0.1394	0.1756E+12
209	54.744	4.0	1430.280	5.0	72.699	0.7202	0.9089E+12
210	54.744	4.0	1431.712	3.0	72.623	0.1287	0.1628E+12
211	0.001	2.0	1376.996	2.0	72.622	0.0973	0.1231E+12
212	72.894	2.0	1450.773	2.0	72.575	0.0063	0.7931E+10
213	115.390	2.0	1497.136	2.0	72.372	1.1178	0.1423E+13
214	115.390	2.0	1499.278	2.0	72.260	0.4994	0.6379E+12
215	72.894	2.0	1457.478	2.0	72.224	0.4954	0.6334E+12
216	29.106	3.0	1417.280	2.0	72.037	0.0556	0.7145E+11
217	72.894	2.0	1461.231	3.0	72.029	0.9339	0.1201E+13
218	115.390	2.0	1506.684	3.0	71.876	1.3515	0.1745E+13
219	112.588	4.0	1506.684	3.0	71.731	0.0413	0.5355E+11
220	0.001	2.0	1397.292	1.0	71.567	0.0205	0.2670E+11
221	83.570	1.0	1484.320	1.0	71.390	0.1167	0.1527E+12
222	29.106	3.0	1431.712	3.0	71.296	1.3919	0.1826E+13
223	54.744	4.0	1461.231	3.0	71.099	0.2272	0.2998E+12
224	54.744	4.0	1464.553	4.0	70.932	4.8908	0.6484E+13
225	83.570	1.0	1497.136	2.0	70.743	0.4849	0.6462E+12
226	83.570	1.0	1499.278	2.0	70.636	0.7786	0.1041E+13
227	67.182	0.0	1484.320	1.0	70.565	0.6201	0.8306E+12
228	0.001	2.0	1417.280	2.0	70.558	0.1733	0.2322E+12
229	0.001	2.0	1417.325	1.0	70.556	0.0320	0.4287E+11
230	112.588	4.0	1530.071	4.0	70.548	6.3647	0.8530E+13
231	54.744	4.0	1475.559	3.0	70.382	0.8971	0.1208E+13
232	29.106	3.0	1450.773	2.0	70.340	0.0298	0.4021E+11
233	72.894	2.0	1497.136	2.0	70.213	0.0091	0.1231E+11
234	115.390	2.0	1541.124	1.0	70.139	0.1419	0.1923E+12
235	72.894	2.0	1499.278	2.0	70.107	0.0099	0.1338E+11
236	29.106	3.0	1457.478	2.0	70.010	0.3957	0.5384E+12
237	115.390	2.0	1545.730	1.0	69.913	1.5831	0.2160E+13
238	0.001	2.0	1431.712	3.0	69.847	0.0294	0.4025E+11
239	29.106	3.0	1461.231	3.0	69.826	0.7958	0.1089E+13
240	72.894	2.0	1506.684	3.0	69.745	0.1985	0.2722E+12
241	29.106	3.0	1464.553	4.0	69.665	0.2797	0.3844E+12
242	115.390	2.0	1554.209	3.0	69.501	0.0289	0.3988E+11
243	112.588	4.0	1554.209	3.0	69.366	4.2471	0.5887E+13
244	29.106	3.0	1475.559	3.0	69.135	0.0813	0.1135E+12
245	0.001	2.0	1450.773	2.0	68.929	0.0361	0.5073E+11
246	54.744	4.0	1506.684	3.0	68.873	3.3484	0.4708E+13
247	0.001	2.0	1457.478	2.0	68.612	0.1408	0.1995E+12
248	83.570	1.0	1541.124	1.0	68.608	0.4353	0.6168E+12
249	0.001	2.0	1461.231	3.0	68.436	0.0312	0.4444E+11
250	83.570	1.0	1545.730	1.0	68.392	0.3472	0.4951E+12

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
251	29.106	3.0	1497.136	2.0	68.118	0.2214	0.3183E+12
252	72.894	2.0	1541.124	1.0	68.109	1.4969	0.2152E+13
253	29.106	3.0	1499.278	2.0	68.019	2.1749	0.3135E+13
254	72.894	2.0	1545.730	1.0	67.896	0.1445	0.2091E+12
255	67.182	0.0	1541.124	1.0	67.845	0.0577	0.8357E+11
256	54.744	4.0	1530.071	4.0	67.782	0.1895	0.2751E+12
257	0.001	2.0	1475.559	3.0	67.771	0.0090	0.1301E+11
258	29.106	3.0	1506.684	3.0	67.678	0.0060	0.8744E+10
259	67.182	0.0	1545.730	1.0	67.634	0.0694	0.1011E+12
260	72.894	2.0	1554.209	3.0	67.508	0.0661	0.9670E+11
261	115.390	2.0	1596.967	1.0	67.496	0.3247	0.4754E+12
262	0.001	2.0	1484.320	1.0	67.371	1.5489	0.2276E+13
263	0.001	2.0	1497.136	2.0	66.794	0.0317	0.4743E+11
264	0.001	2.0	1499.278	2.0	66.699	0.0159	0.2391E+11
265	54.744	4.0	1554.209	3.0	66.690	0.0080	0.1207E+11
266	29.106	3.0	1530.071	4.0	66.624	0.0531	0.7980E+11
267	83.570	1.0	1596.967	1.0	66.077	0.0084	0.1290E+11
268	72.894	2.0	1596.967	1.0	65.614	0.1254	0.1943E+12
269	29.106	3.0	1554.209	3.0	65.569	0.0166	0.2576E+11
270	67.182	0.0	1596.967	1.0	65.369	0.0086	0.1347E+11
271	0.001	2.0	1545.730	1.0	64.694	0.0079	0.1252E+11
272	0.001	2.0	1596.967	1.0	62.619	0.0368	0.6264E+11



Mo XXIV　グロトリアン・ダイアグラム

Mo XXIV　エネルギー レベル

EVEN 1　$(3p)^6$ $(3d)$
2　$(3p)^6$ $(4s)$
3　$(3p)^6$ $(4d)$

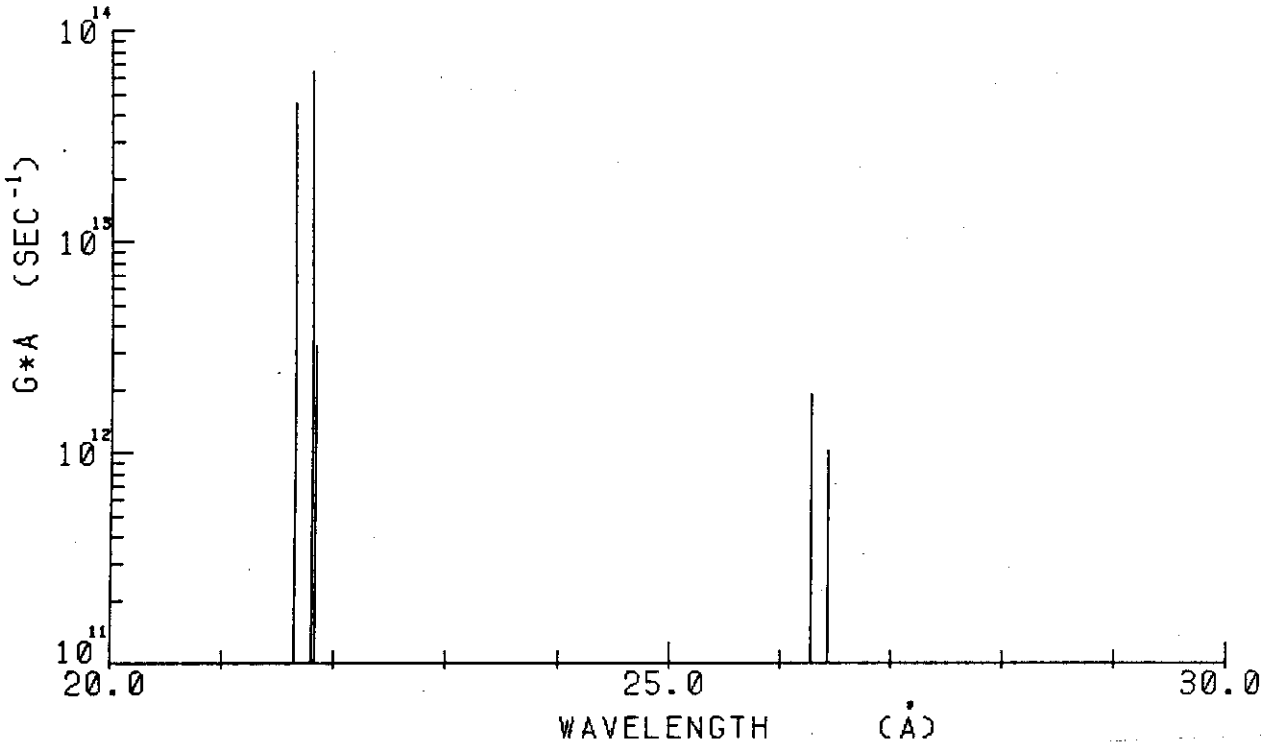
ODD 1　$(3p)^6$ $(4p)$
2　$(3p)^6$ $(4f)$

EVEN PARITY

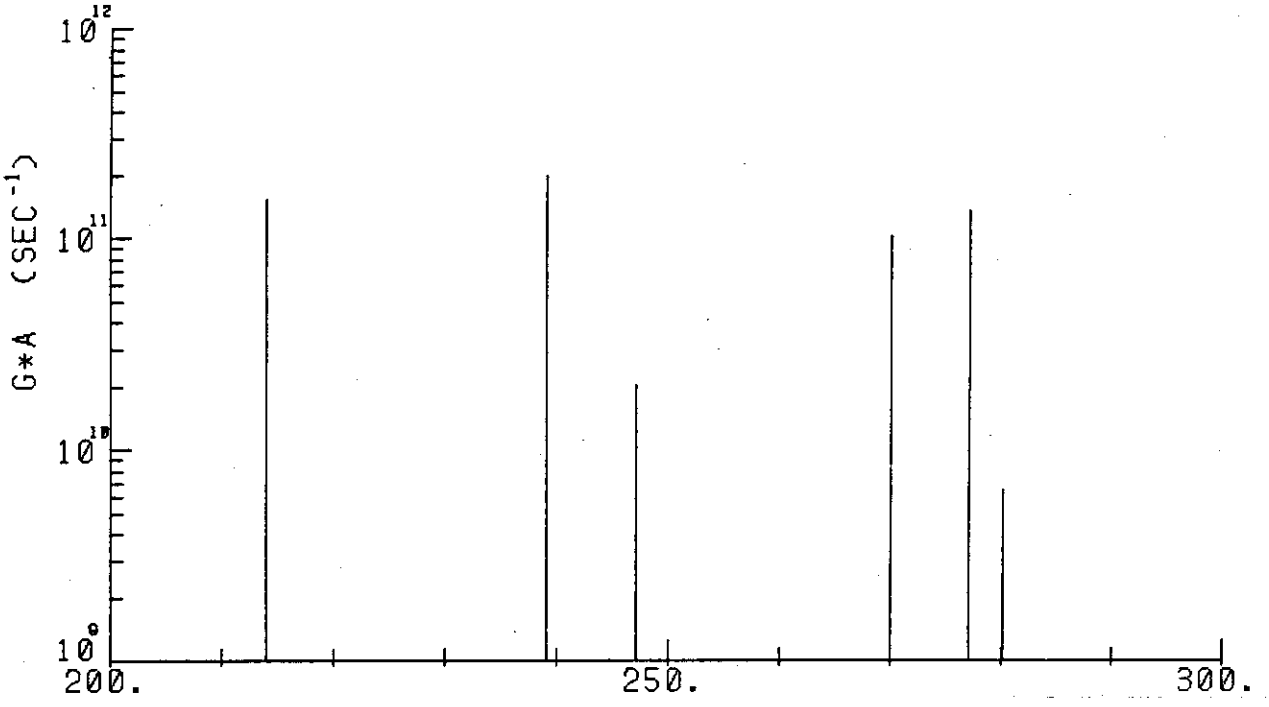
J	NO	ENERGY(KK)			LEADING PERCENTAGES
0.5	1	3516.750	---	2	2S100.0%
1.5	1	0.000	---	1	2D100.0%
1.5	2	4249.016	---	3	2D100.0%
2.5	1	38.750	---	1	2D100.0%
2.5	2	4262.566	---	3	2D100.0%

ODD PARITY

J	NO	ENERGY(KK)			LEADING PERCENTAGES
0.5	1	3781.850	---	1	2P100.0%
1.5	1	3844.310	---	1	2P100.0%
2.5	1	4619.320	---	2	2F100.0%
3.5	1	4623.344	---	2	2F100.0%



Mo XXIV　スペクトル・パターン
$(3p)^6\ (3d) - (3p)^6\ (4p)$
$- (3p)^6\ (4f)$



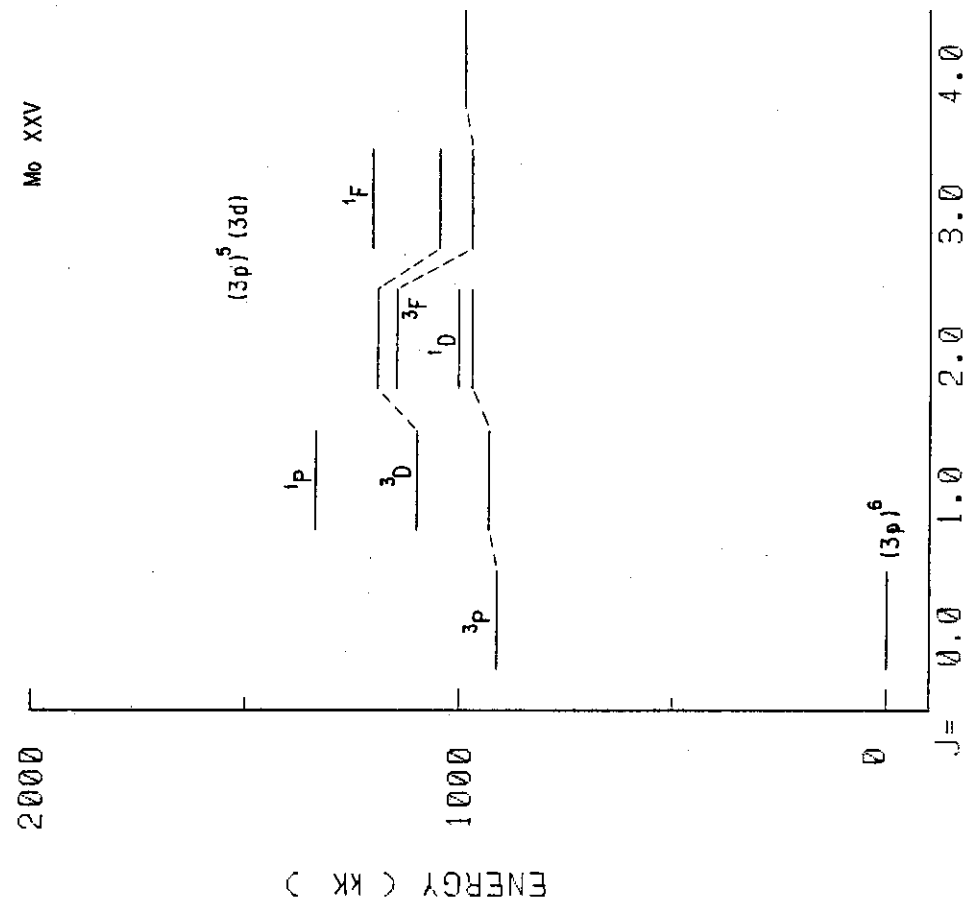
Mo XXIV　スペクトル・パターン
n ＝4－4

Mo XXIV　波長，振動子強度

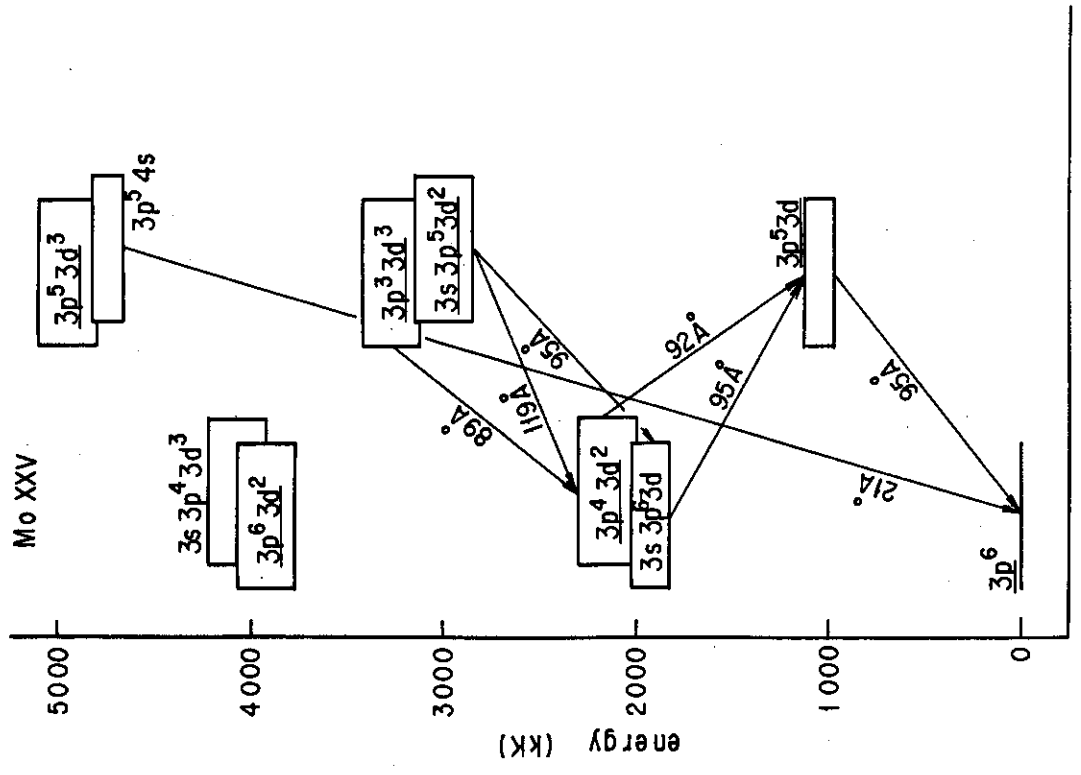
$(3p)^6(3d) - (3p)^6(4p) - (3p)^6(4f)$

n＝4　－　n＝4

NO	EVEN PARITY (KK)	J	ODD PARITY (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
1	3516.750	0.5	3781.849	0.5	377.218	0.3141	0.1472E+11
2	3516.750	0.5	3844.309	1.5	305.288	0.7762	0.5554E+11
3	4262.562	2.5	4619.316	2.5	280.305	0.0768	0.6517E+10
4	4262.562	2.5	4623.340	3.5	277.179	1.5527	0.1348E+12
5	4249.012	1.5	4619.316	2.5	270.048	1.1156	0.1020E+12
6	4249.012	1.5	3844.309	1.5	247.093	0.1851	0.2022E+11
7	4262.562	2.5	3844.309	1.5	239.087	1.7217	0.2009E+12
8	4249.012	1.5	3781.849	0.5	214.057	1.0684	0.1555E+12
9	0.000	1.5	3781.849	0.5	26.442	0.1075	0.1025E+13
10	38.750	2.5	3844.309	1.5	26.277	0.1947	0.1881E+13
11	38.750	2.5	4619.316	2.5	21.831	0.2291	0.3206E+13
12	38.750	2.5	4623.340	3.5	21.812	4.5863	0.6430E+14
13	0.000	1.5	4619.316	2.5	21.648	3.2347	0.4604E+14



Mo XXV エネルギーレベル
$(3p)^6$, $(3p)^5(3d)$



Mo XXV グロトリアン・ダイアグラム

Mo XXV エネルギー・レベル

EVEN $(3p)^6$

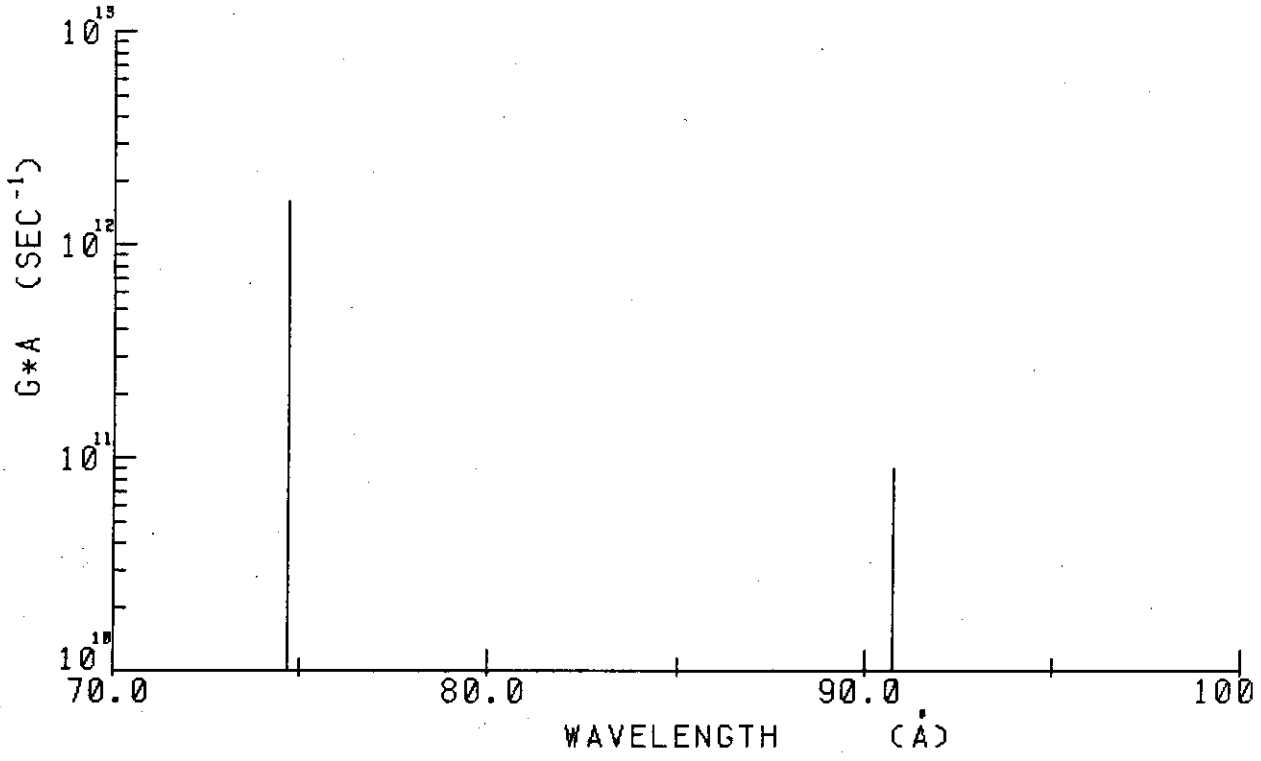
ODD $(3p)^5(3d)$

EVEN PARITY

J	NO	ENERGY(KK)		LEADING PERCENTAGES				
0.0	1	0.002	---	1	1S	98.1%		

ODD PARITY

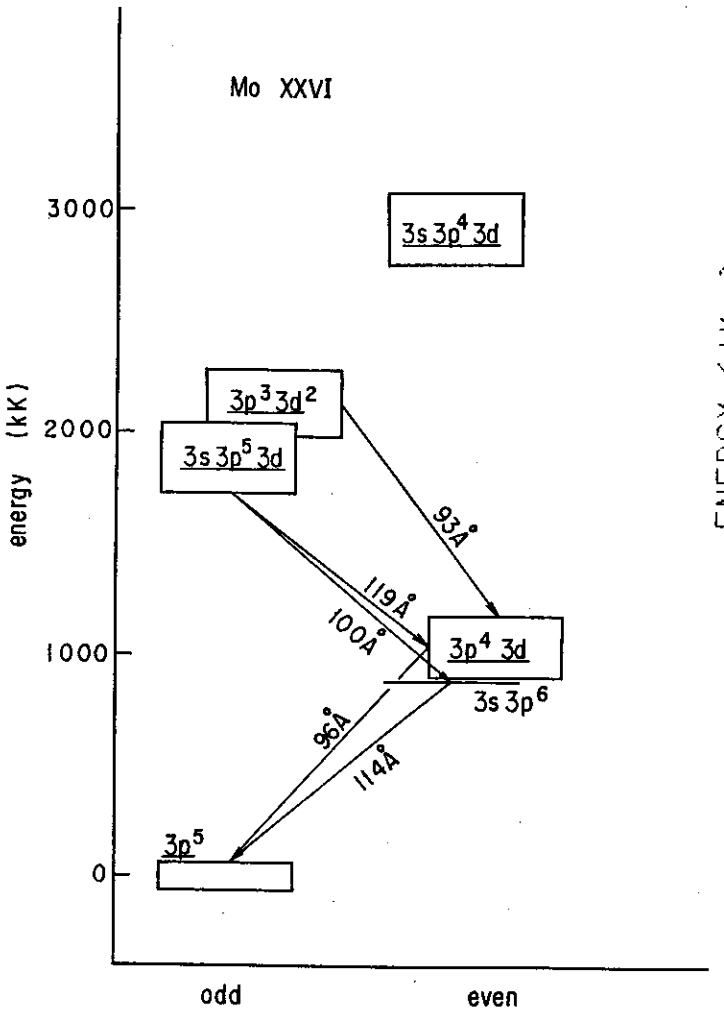
J	NO	ENERGY(KK)		LEADING PERCENTAGES				
0.0	1	913.409	---	1	3P	98.5%		
1.0	1	934.848	---	1	3P	87.9%	1	3D 10.5%
1.0	2	1101.781	---	1	3D	79.8%	1	3P 9.4%
1.0	3	1339.177	---	1	1P	88.5%	1	3D 8.0%
2.0	1	975.192	---	1	3P	52.4%	1	3D 37.4%
2.0	2	1005.623	---	1	1D	45.5%	1	3F 28.1%
2.0	3	1148.175	---	1	3F	59.8%	1	1D 31.4%
2.0	4	1192.434	---	1	3D	48.8%	1	3P 26.1%
3.0	1	973.909	---	1	3F	66.4%	1	1F 24.4%
3.0	2	1048.969	---	1	3D	63.8%	1	1F 34.1%
3.0	3	1207.664	---	1	1F	40.0%	1	3F 31.5%
4.0	1	990.058	---	1	3F	98.6%		



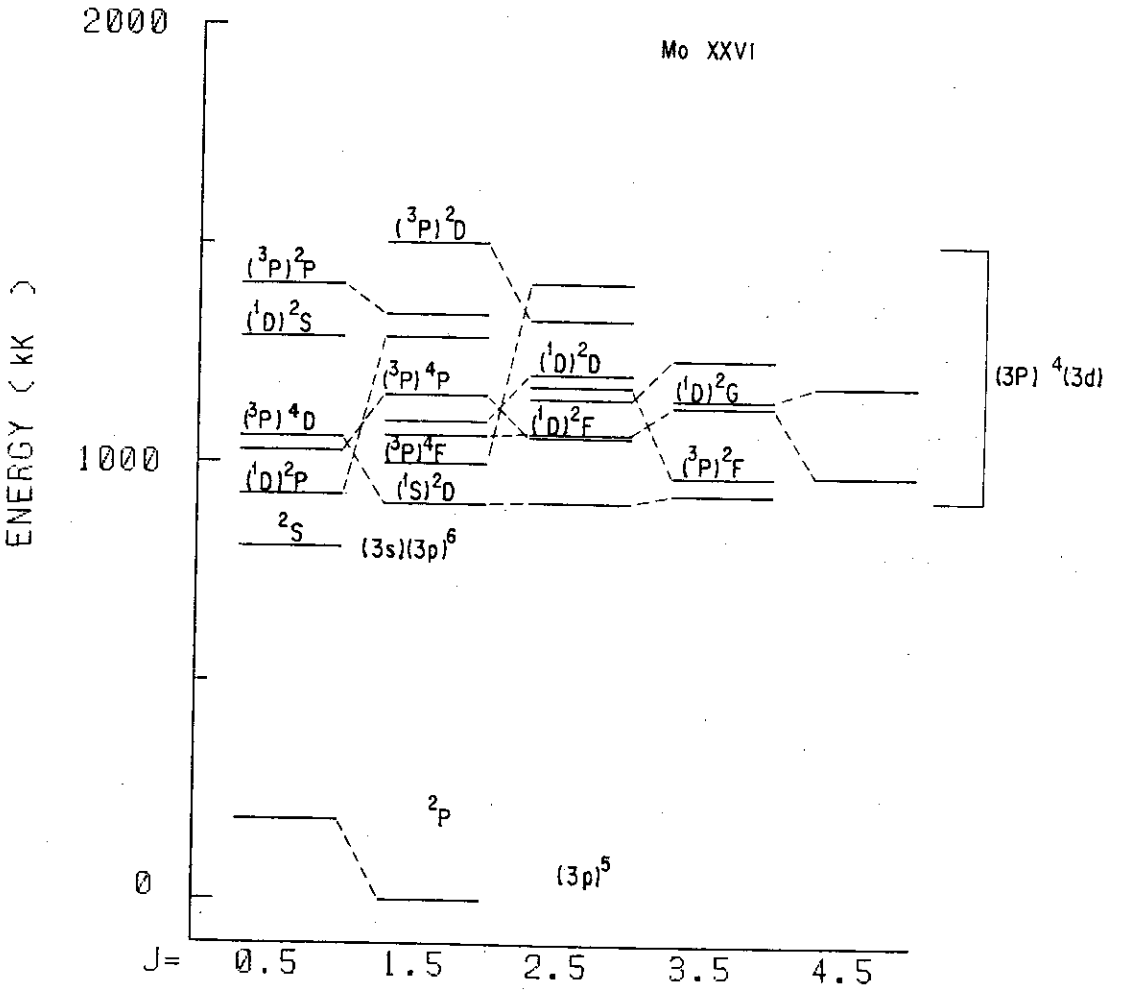
Mo XXV スペクトル・パターン
$(3p)^6 - (3p)^5\ (3d)$

Mo XXV 波長，振動子強度
$(3p)^6 - (3p)^5\ (3d)$

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
1	0.002	0.0	1101.781	1.0	90.762	0.1107	0.8963E+11
2	0.002	0.0	1339.177	1.0	74.673	1.3383	0.1601E+13



Mo XXVI　グロトリアン・ダイアグラム



Mo XXVI　エネルギーレベル
$(3s)^2\ (3p)^5$, $(3s)\ (3p)^6$, $(3s)^2\ (3p)^4\ (3d)$

Mo XXVI エネルギーレベル

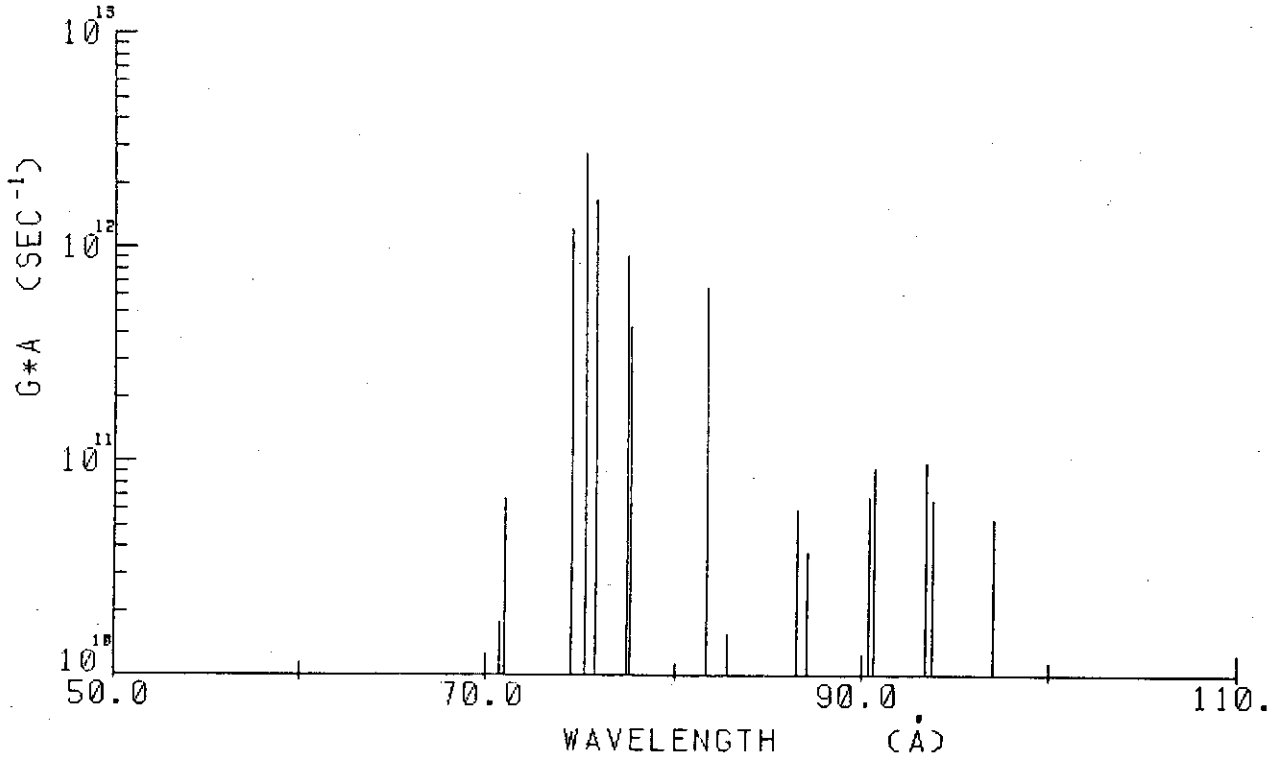
ODD $(3s)^2\ (3p)^5$

EVEN 1 $(3s)\ (3p)^6$

2 $(3s)^2\ (3p)^4\ (3d)$

ODD PARITY J	NO	ENERGY(KK)		LEADING PERCENTAGES	
0.5	1	185.190	---	1 2P 98.0%	
1.5	1	0.005	---	1 2P 98.2%	

EVEN PARITY J	NO	ENERGY(KK)		LEADING PERCENTAGES	
0.5	1	811.395	---	1 (2S) 2S 69.7%	2 (1D) 2S 25.7%
0.5	2	928.647	---	2 (3P) 4D 34.2%	2 (1D) 2P 26.1%
0.5	3	1030.316	---	2 (3P) 4P 61.9%	2 (3P) 2P 18.6%
0.5	4	1063.491	---	2 (3P) 4D 64.8%	2 (1D) 2P 13.3%
0.5	5	1291.668	---	2 (1D) 2S 62.2%	1 (2S) 2S 18.8%
0.5	6	1408.689	---	2 (3P) 2P 46.0%	2 (1D) 2P 42.9%
1.5	1	909.361	---	2 (3P) 4D 52.2%	2 (1D) 2D 14.2%
1.5	2	1000.539	---	2 (1S) 2D 33.8%	2 (3P) 4P 22.7%
1.5	3	1066.391	---	2 (3P) 4F 36.7%	2 (3P) 4P 22.9%
1.5	4	1096.961	---	2 (3P) 4D 33.2%	2 (1D) 2P 14.1%
1.5	5	1156.818	---	2 (3P) 4P 28.7%	2 (1D) 2P 24.7%
1.5	6	1288.110	---	2 (1D) 2P 29.9%	2 (1S) 2D 26.8%
1.5	7	1341.735	---	2 (3P) 2P 32.7%	2 (1D) 2D 28.7%
1.5	8	1504.343	---	2 (3P) 2D 46.3%	2 (1S) 2D 25.4%
2.5	1	913.402	---	2 (3P) 4D 64.8%	2 (1D) 2D 8.9%
2.5	2	1061.669	---	2 (1S) 2D 36.2%	2 (3P) 4F 29.7%
2.5	3	1070.207	---	2 (3P) 4F 32.2%	2 (3P) 4P 19.9%
2.5	4	1148.144	---	2 (1D) 2F 30.8%	2 (1D) 2D 23.7%
2.5	5	1176.727	---	2 (3P) 2F 48.7%	2 (3P) 4P 25.3%
2.5	6	1207.433	---	2 (1D) 2D 40.1%	2 (1D) 2F 30.0%
2.5	7	1329.246	---	2 (3P) 2D 60.7%	2 (1D) 2D 17.1%
2.5	8	1414.343	---	2 (1S) 2D 47.6%	2 (3P) 2F 16.6%
3.5	1	934.998	---	2 (3P) 4D 59.0%	2 (3P) 4F 26.5%
3.5	2	973.737	---	2 (3P) 2F 46.8%	2 (1D) 2G 26.2%
3.5	3	1135.603	---	2 (3P) 4F 53.9%	2 (3P) 4D 22.1%
3.5	4	1150.708	---	2 (1D) 2G 55.8%	2 (3P) 2F 23.4%
3.5	5	1240.606	---	2 (1D) 2F 67.8%	2 (3P) 2F 18.0%
4.5	1	977.111	---	2 (3P) 4F 76.1%	2 (1D) 2G 23.2%
4.5	2	1183.831	---	2 (1D) 2G 76.1%	2 (3P) 4F 23.2%



Mo XXVI　スペクトル・パターン

$(3s)^2\ (3p)^5 - (3s)\ (3p)^6$

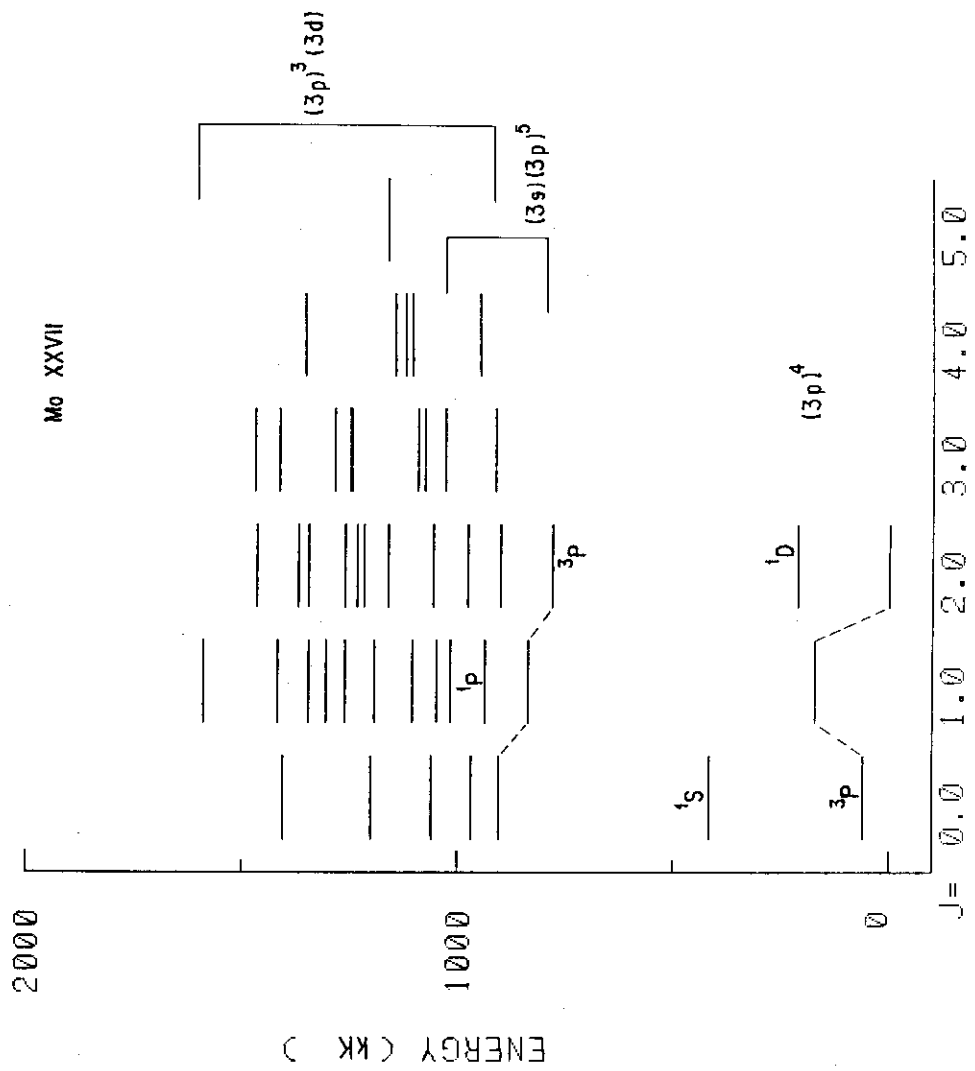
$(3s)^2\ (3p)^4\ (3d)$

Mo XXVI　波長，振動子強度

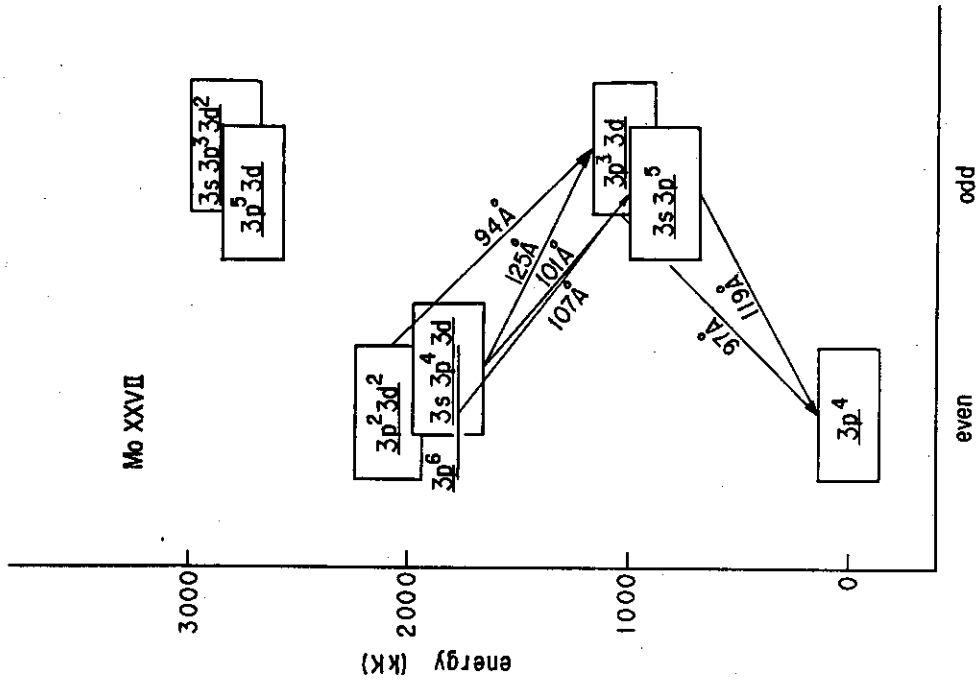
$(3p)^5 - (3s)\ (3p)^6$

$(3s)^2\ (3p)^4\ (3d)$

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
1	185.190	0.5	811.394	0.5	159.692	0.0483	0.1263E+11
2	0.005	1.5	811.394	0.5	123.245	0.0854	0.3750E+11
3	185.190	0.5	1030.316	0.5	118.326	0.0130	0.6213E+10
4	0.005	1.5	928.646	0.5	107.684	0.0071	0.4075E+10
5	0.005	1.5	1000.539	1.5	99.947	0.0085	0.5705E+10
6	0.005	1.5	1030.316	0.5	97.058	0.0765	0.5415E+11
7	0.005	1.5	1061.669	2.5	94.192	0.0120	0.9035E+10
8	0.005	1.5	1066.390	1.5	93.775	0.0876	0.6643E+11
9	0.005	1.5	1070.207	2.5	93.440	0.1305	0.9966E+11
10	185.190	0.5	1288.109	1.5	90.669	0.1159	0.9400E+11
11	185.190	0.5	1291.668	0.5	90.377	0.0838	0.6847E+11
12	0.005	1.5	1148.144	2.5	87.098	0.0436	0.3831E+11
13	185.190	0.5	1341.734	1.5	86.465	0.0675	0.6019E+11
14	0.005	1.5	1207.433	2.5	82.821	0.0162	0.1577E+11
15	185.190	0.5	1408.688	0.5	81.733	0.6652	0.6641E+12
16	0.005	1.5	1288.109	1.5	77.634	0.3874	0.4288E+12
17	0.005	1.5	1291.668	0.5	77.420	0.8249	0.9179E+12
18	185.190	0.5	1504.342	1.5	75.806	1.4701	0.1706E+13
19	0.005	1.5	1329.245	2.5	75.231	2.3770	0.2801E+13
20	0.005	1.5	1341.734	1.5	74.531	1.0374	0.1246E+13
21	0.005	1.5	1408.688	0.5	70.988	0.0510	0.6756E+11
22	0.005	1.5	1414.342	2.5	70.705	0.0134	0.1790E+11



Mo XXVII　エネルギーレベル
$(3s)^2(3p)^4$, $(3s)^2(3p)^3(3d)$, $(3s)(3p)^5$



Mo XXVII　グロトリアン・ダイアグラム

Mo XXVII　エネルギー レベル

EVEN　$(3s)^2\ (3p)^4$

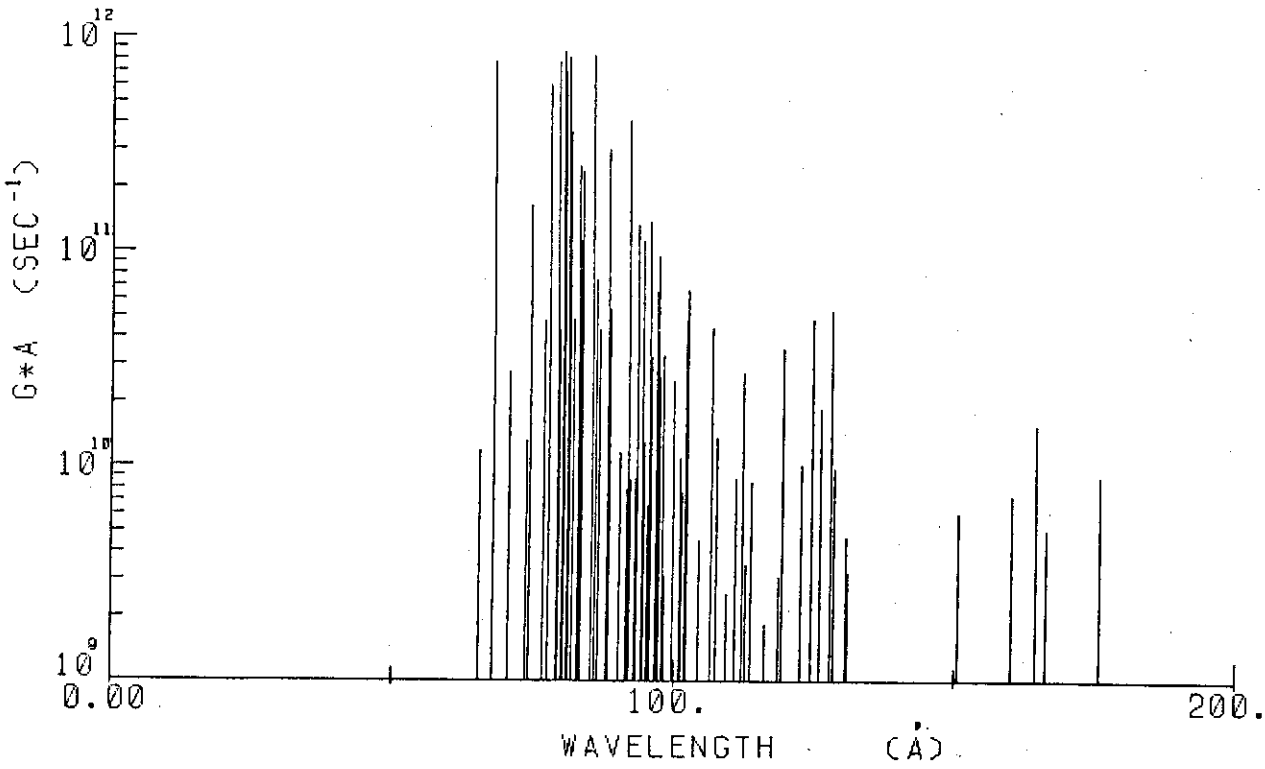
ODD 1　$(3s)^2\ (3p)^3\ (3d)$

2　$(3s)\ (3p)^5$

EVEN PARITY

J	NO	ENERGY(KK)		LEADING PERCENTAGES			
0.0	1	60.333	---	1	3P 49.4%	1	1S 48.5%
0.0	2	416.542	---	1	1S 48.8%	1	3P 48.7%
1.0	1	174.488	---	1	3P 98.2%		
2.0	1	-0.003	---	1	3P 76.2%	1	1D 22.1%
2.0	2	214.096	---	1	1D 76.1%	1	3P 22.1%

ODD J	PARITY NO	ENERGY(KK)		LEADING PERCENTAGES	
0.0	1	906.651	---	1 (4S) 5D 55.9%	1 (2P) 3P 29.1%
0.0	2	967.945	---	2 (2S) 3P 68.9%	1 (2D) 3P 25.6%
0.0	3	1061.523	---	1 (2D) 1S 60.7%	1 (4S) 5D 26.8%
0.0	4	1202.956	---	1 (2D) 3P 29.9%	1 (2D) 1S 27.8%
0.0	5	1403.736	---	1 (2D) 3P 39.4%	1 (2P) 3P 36.5%
1.0	1	838.488	---	2 (2S) 3P 45.3%	2 (2S) 1P 16.3%
1.0	2	939.217	---	1 (4S) 5D 60.6%	2 (2S) 3P 13.2%
1.0	3	1017.719	---	1 (2D) 1P 29.8%	2 (2S) 1P 28.1%
1.0	4	1048.806	---	1 (4S) 3D 45.5%	1 (2D) 3D 22.8%
1.0	5	1105.627	---	1 (2D) 3D 45.0%	1 (2P) 3D 27.5%
1.0	6	1195.475	---	1 (2P) 3P 29.3%	1 (2D) 3S 17.2%
1.0	7	1261.701	---	1 (2D) 3P 50.2%	1 (2D) 1P 15.8%
1.0	8	1303.731	---	1 (2D) 3S 55.4%	2 (2S) 1P 14.6%
1.0	9	1347.540	---	1 (2P) 1P 24.2%	1 (2P) 3D 20.9%
1.0	10	1417.930	---	1 (2P) 3P 22.8%	1 (2P) 3D 14.4%
1.0	11	1588.894	---	1 (2P) 1P 55.1%	1 (4S) 3D 16.0%
2.0	1	782.363	---	2 (2S) 3P 78.7%	1 (2D) 3P 11.1%
2.0	2	900.988	---	1 (4S) 5D 26.4%	1 (2D) 3F 19.2%
2.0	3	977.160	---	1 (4S) 5D 44.5%	1 (2D) 3D 16.2%
2.0	4	1056.374	---	1 (2D) 3F 41.0%	1 (2D) 3D 25.2%
2.0	5	1160.796	---	1 (2P) 3F 40.5%	1 (2P) 1D 23.3%
2.0	6	1218.019	---	1 (2P) 3D 36.1%	1 (4S) 3D 13.8%
2.0	7	1234.738	---	1 (2P) 3P 29.2%	1 (2P) 3F 20.0%
2.0	8	1260.864	---	1 (2D) 3P 32.1%	1 (2D) 3D 21.7%
2.0	9	1347.227	---	1 (2D) 1D 37.8%	1 (4S) 3D 26.6%
2.0	10	1370.278	---	1 (2D) 3P 27.5%	1 (2P) 1D 21.9%
2.0	11	1464.071	---	1 (2D) 1D 34.0%	1 (2P) 3D 21.6%
3.0	1	913.197	---	1 (4S) 5D 42.1%	1 (2P) 3F 18.5%
3.0	2	1029.227	---	1 (2D) 3G 34.9%	1 (4S) 5D 24.4%
3.0	3	1075.960	---	1 (2D) 3F 63.8%	1 (4S) 5D 11.3%
3.0	4	1092.714	---	1 (2D) 3D 38.5%	1 (4S) 3D 18.9%
3.0	5	1245.812	---	1 (2P) 3F 45.3%	1 (2P) 3D 21.7%
3.0	6	1248.600	---	1 (2D) 3D 32.1%	1 (2P) 1F 23.1%
3.0	7	1285.205	---	1 (2D) 1F 40.0%	1 (2P) 3D 15.7%
3.0	8	1414.697	---	1 (2P) 3D 29.5%	1 (2P) 1F 22.8%
3.0	9	1471.034	---	1 (2D) 1F 34.9%	1 (2P) 1F 33.8%
4.0	1	948.900	---	1 (4S) 5D 57.8%	1 (2P) 3F 29.9%
4.0	2	1106.427	---	1 (2D) 3G 60.7%	1 (4S) 5D 24.0%
4.0	3	1122.494	---	1 (2D) 3F 56.1%	1 (2D) 1G 33.1%
4.0	4	1145.812	---	1 (2D) 1G 44.7%	1 (2D) 3F 36.6%
4.0	5	1353.634	---	1 (2P) 3F 58.4%	1 (2D) 1G 15.4%
5.0	1	1160.827	---	1 (2D) 3G 99.0%	



Mo XXVII　スペクトル・パターン

$(3s)^2\ (3p)^4 - (3s)^2\ (3p)^3\ (3d)$

$(3s)\ (3p)^5$

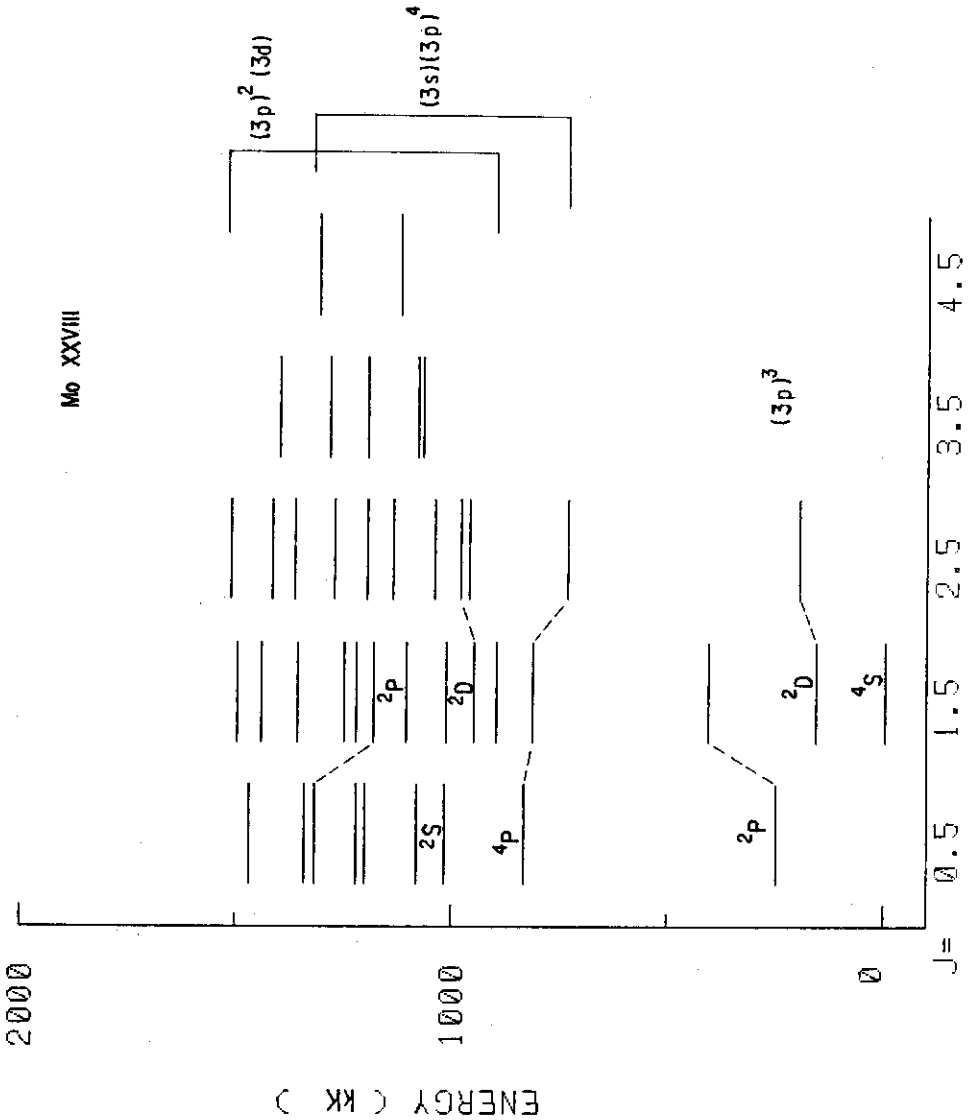
Mo XXVII　波長，振動子強度

$(3s)^2\,(3p)^4 - (3s)^2\,(3p)^3\,(3d)$

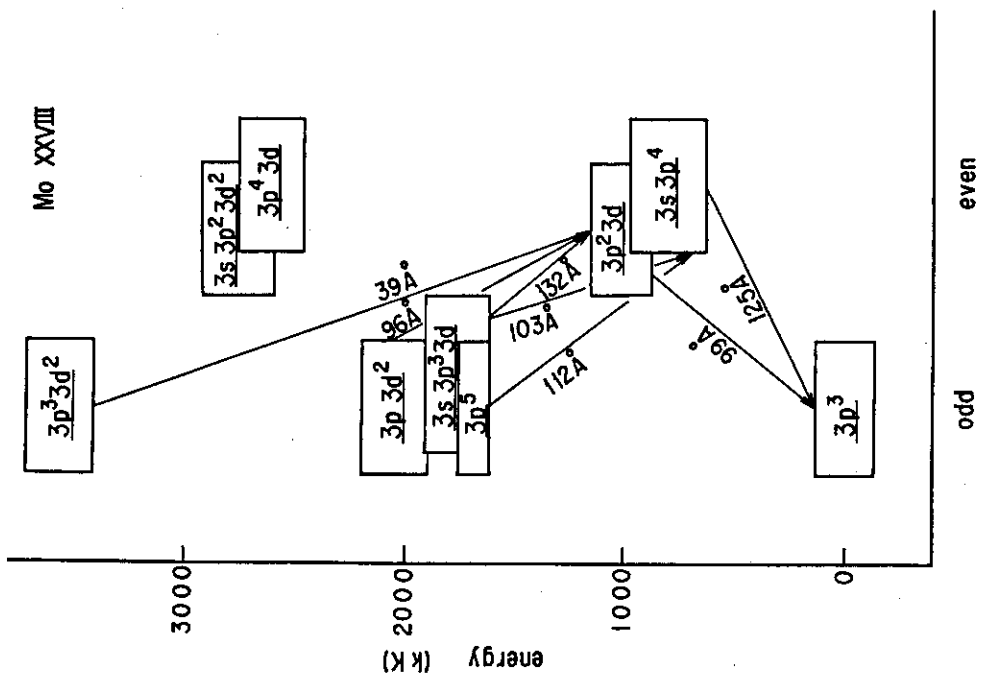
$(3s)\,(3p)^5$

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
1	416.542	0.0	838.487	1.0	236.997	0.0030	0.3571E+09
2	416.542	0.0	939.217	1.0	191.323	0.0020	0.3554E+09
3	214.096	2.0	782.362	2.0	175.974	0.0418	0.9009E+10
4	416.542	0.0	1017.719	1.0	166.340	0.0211	0.5078E+10
5	174.487	1.0	782.362	2.0	164.507	0.0631	0.1556E+11
6	214.096	2.0	838.487	1.0	160.156	0.0282	0.7323E+10
7	174.487	1.0	838.487	1.0	150.602	0.0211	0.6192E+10
8	416.542	0.0	1105.626	1.0	145.120	0.0027	0.8697E+09
9	214.096	2.0	939.217	1.0	137.908	0.0028	0.9684E+09
10	214.096	2.0	977.160	2.0	131.051	0.0083	0.3215E+10
11	174.487	1.0	939.217	1.0	130.765	0.0122	0.4753E+10
12	60.333	0.0	838.487	1.0	128.509	0.0245	0.9899E+10
13	416.542	0.0	1195.474	1.0	128.381	0.0087	0.3533E+10
14	-0.003	2.0	782.362	2.0	127.817	0.1325	0.5409E+11
15	174.487	1.0	967.944	0.0	126.031	0.0451	0.1893E+11
16	174.487	1.0	977.160	2.0	124.584	0.0077	0.3329E+10
17	214.096	2.0	1017.719	1.0	124.437	0.1136	0.4892E+11
18	214.096	2.0	1029.227	3.0	122.680	0.0231	0.1023E+11
19	-0.003	2.0	838.487	1.0	119.262	0.0762	0.3575E+11
20	174.487	1.0	1017.719	1.0	118.591	0.0066	0.3128E+10
21	214.096	2.0	1075.959	3.0	116.028	0.0037	0.1847E+10
22	214.096	2.0	1092.713	3.0	113.815	0.0037	0.1891E+10
23	60.333	0.0	939.217	1.0	113.781	0.0165	0.8501E+10
24	416.542	0.0	1303.730	1.0	112.716	0.0067	0.3524E+10
25	214.096	2.0	1105.626	1.0	112.167	0.0526	0.2788E+11
26	-0.003	2.0	900.988	2.0	110.989	0.0164	0.8856E+10
27	-0.003	2.0	913.197	3.0	109.505	0.0047	0.2596E+10
28	416.542	0.0	1347.540	1.0	107.412	0.0239	0.1384E+11
29	-0.003	2.0	939.217	1.0	106.471	0.0769	0.4526E+11
30	60.333	0.0	1017.719	1.0	104.451	0.0075	0.4591E+10
31	-0.003	2.0	977.160	2.0	102.337	0.1052	0.6698E+11
32	214.096	2.0	1195.474	1.0	101.898	0.0749	0.4811E+11
33	174.487	1.0	1160.796	2.0	101.388	0.0119	0.7702E+10
34	60.333	0.0	1048.806	1.0	101.166	0.0170	0.1109E+11
35	416.542	0.0	1417.929	1.0	99.861	0.0382	0.2558E+11
36	-0.003	2.0	1017.719	1.0	98.259	0.0045	0.3128E+10
37	174.487	1.0	1195.474	1.0	97.944	0.0477	0.3315E+11
38	174.487	1.0	1202.956	0.0	97.232	0.0373	0.2631E+11
39	-0.003	2.0	1029.227	3.0	97.160	0.0735	0.5193E+11
40	214.096	2.0	1245.811	3.0	96.926	0.1373	0.9750E+11
41	214.096	2.0	1248.600	3.0	96.665	0.0921	0.6571E+11
42	174.487	1.0	1218.019	2.0	95.828	0.0455	0.3307E+11
43	60.333	0.0	1105.626	1.0	95.667	0.0841	0.6132E+11
44	214.096	2.0	1260.864	2.0	95.532	0.1929	0.1410E+12
45	214.096	2.0	1261.701	1.0	95.456	0.0113	0.8306E+10
46	-0.003	2.0	1048.806	1.0	95.346	0.0090	0.6596E+10
47	-0.003	2.0	1056.374	2.0	94.663	0.0175	0.1305E+11
48	174.487	1.0	1234.737	2.0	94.317	0.1530	0.1147E+12
49	214.096	2.0	1285.205	3.0	93.361	0.1784	0.1365E+12
50	-0.003	2.0	1075.959	3.0	92.940	0.0114	0.8819E+10

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
51	174.487	1.0	1260.864	2.0	92.049	0.0111	0.8740E+10
52	174.487	1.0	1261.701	1.0	91.978	0.0822	0.6477E+11
53	214.096	2.0	1303.730	1.0	91.774	0.5283	0.4184E+12
54	-0.003	2.0	1092.713	3.0	91.515	0.0100	0.7950E+10
55	-0.003	2.0	1105.626	1.0	90.446	0.0142	0.1159E+11
56	174.487	1.0	1303.730	1.0	88.555	0.0648	0.5513E+11
57	214.096	2.0	1347.227	2.0	88.251	0.3539	0.3031E+12
58	214.096	2.0	1347.540	1.0	88.227	0.2535	0.2172E+12
59	214.096	2.0	1370.278	2.0	86.492	0.0493	0.4391E+11
60	-0.003	2.0	1160.796	2.0	86.148	0.0831	0.7466E+11
61	416.542	0.0	1588.894	1.0	85.299	0.9085	0.8328E+12
62	174.487	1.0	1347.227	2.0	85.270	0.7579	0.6952E+12
63	174.487	1.0	1347.540	1.0	85.248	0.0665	0.6107E+11
64	-0.003	2.0	1195.474	1.0	83.649	0.2120	0.2021E+12
65	174.487	1.0	1370.278	2.0	83.627	0.2530	0.2413E+12
66	60.333	0.0	1261.701	1.0	83.238	0.1202	0.1157E+12
67	214.096	2.0	1417.929	1.0	83.068	0.2613	0.2525E+12
68	-0.003	2.0	1218.019	2.0	82.100	0.0494	0.4892E+11
69	174.487	1.0	1403.736	0.0	81.351	0.3660	0.3689E+12
70	-0.003	2.0	1234.737	2.0	80.989	0.8086	0.8222E+12
71	60.333	0.0	1303.730	1.0	80.425	0.2807	0.2894E+12
72	174.487	1.0	1417.929	1.0	80.422	0.6814	0.7027E+12
73	-0.003	2.0	1245.811	3.0	80.269	0.5667	0.5866E+12
74	-0.003	2.0	1248.600	3.0	80.089	0.3527	0.3668E+12
75	214.096	2.0	1464.070	2.0	80.002	0.8426	0.8781E+12
76	214.096	2.0	1471.034	3.0	79.558	0.0413	0.4352E+11
77	-0.003	2.0	1260.864	2.0	79.311	0.6406	0.6793E+12
78	-0.003	2.0	1261.701	1.0	79.258	0.7336	0.7789E+12
79	-0.003	2.0	1285.205	3.0	77.808	0.4231	0.4661E+12
80	60.333	0.0	1347.540	1.0	77.688	0.5567	0.6152E+12
81	174.487	1.0	1464.070	2.0	77.544	0.4609	0.5112E+12
82	-0.003	2.0	1303.730	1.0	76.703	0.0429	0.4863E+11
83	-0.003	2.0	1347.227	2.0	74.226	0.1361	0.1647E+12
84	60.333	0.0	1417.929	1.0	73.660	0.0109	0.1341E+11
85	174.487	1.0	1588.894	1.0	70.701	0.0207	0.2765E+11
86	-0.003	2.0	1471.034	3.0	67.979	0.5442	0.7854E+12
87	60.333	0.0	1588.894	1.0	65.421	0.0076	0.1182E+11



Mo XXVIII　エネルギー・レベル
$(3s)^2(3p)^3$, $(3s)^2(3p)^2(3d)$, $(3s)(3p)^4$



Mo XXVIII　グロトリアン・ダイアグラム

Mo XXVIII　エネルギー レベル

ODD　　$(3s)^2\ (3p)^3$

EVEN 1　$(3s)\ (3p)^2\ (3d)$

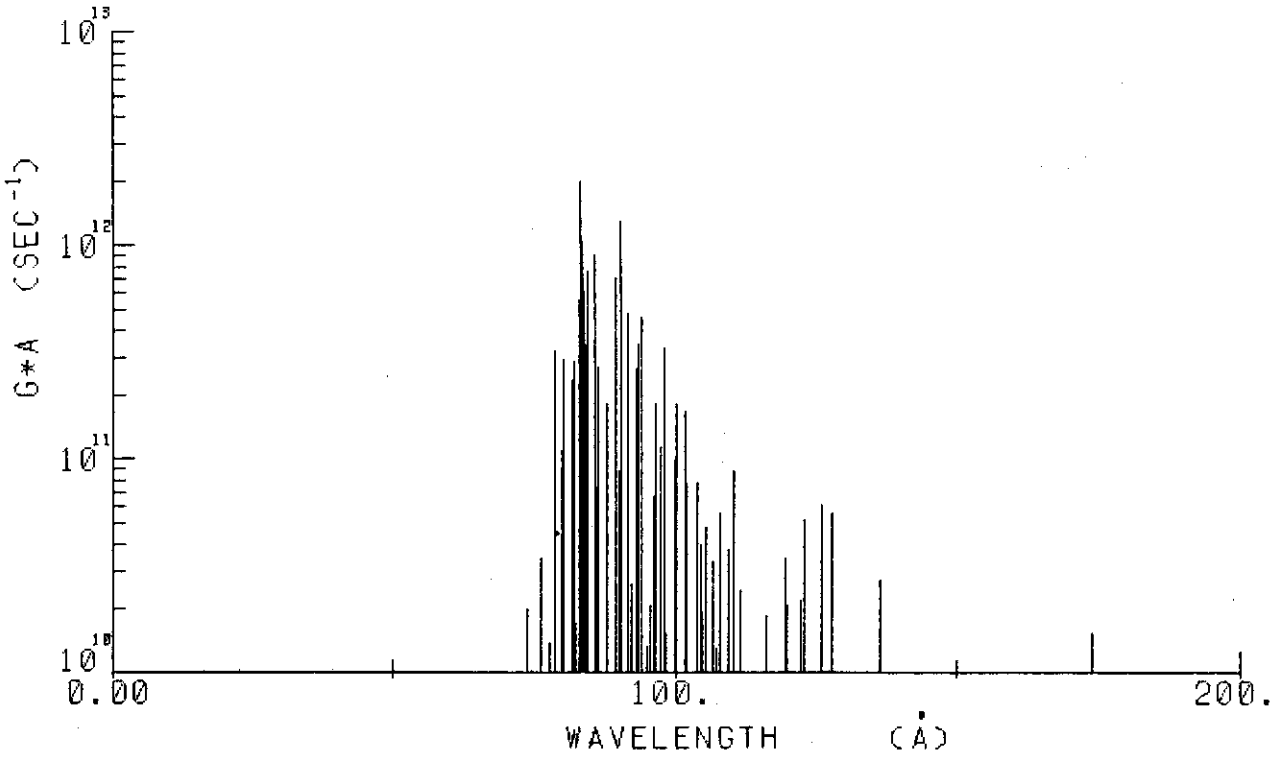
2　$(3s)\ (3p)^4$

ODD PARITY

J	NO	ENERGY(KK)		LEADING PERCENTAGES					
0.5	1	249.963	---	1		2P 97.9%			
1.5	1	-0.003	---	1		4S 44.5%	1		2P 35.3%
1.5	2	156.940	---	1		2D 51.5%	1		4S 42.5%
1.5	3	406.598	---	1		2P 58.0%	1		2D 28.3%
2.5	1	199.307	---	1		2D 98.3%			

EVEN PARITY

J	NO	ENERGY(KK)		LEADING PERCENTAGES					
0.5	1	835.806	---	2	(3P)	4P 59.2%	2	(1S)	2S 28.2%
0.5	2	1018.165	---	1	(3P)	4D 35.2%	1	(3P)	2P 23.0%
0.5	3	1083.683	---	1	(3P)	4D 51.5%	2	(1S)	2S 15.5%
0.5	4	1203.269	---	1	(3P)	4P 35.0%	1	(3P)	2P 21.4%
0.5	5	1223.370	---	1	(1D)	2S 22.5%	1	(3P)	2P 19.3%
0.5	6	1319.635	---	2	(3P)	2P 31.0%	1	(1D)	2S 27.8%
0.5	7	1343.224	---	1	(1D)	2P 59.7%	1	(3P)	4P 20.8%
0.5	8	1470.104	---	1	(1D)	2S 34.8%	2	(1S)	2S 15.9%
1.5	1	814.387	---	2	(3P)	4P 40.4%	2	(1D)	2D 18.6%
1.5	2	896.522	---	1	(3P)	4F 33.9%	2	(3P)	4P 32.6%
1.5	3	949.745	---	2	(1D)	2D 38.9%	1	(3P)	4F 16.3%
1.5	4	1012.254	---	1	(3P)	2P 33.1%	1	(3P)	4F 20.1%
1.5	5	1106.008	---	1	(3P)	4D 53.0%	2	(3P)	2P 13.7%
1.5	6	1182.801	---	2	(3P)	2P 33.8%	1	(3P)	2P 19.1%
1.5	7	1220.698	---	1	(3P)	4P 39.2%	1	(1D)	2P 33.4%
1.5	8	1251.324	---	1	(3P)	2D 40.2%	1	(1S)	2D 17.5%
1.5	9	1359.486	---	1	(1D)	2D 43.7%	1	(3P)	4P 19.3%
1.5	10	1442.259	---	1	(1D)	2P 30.4%	1	(1S)	2D 29.7%
1.5	11	1499.486	---	1	(3P)	2D 44.7%	1	(1S)	2D 27.3%
2.5	1	732.015	---	2	(3P)	4P 76.6%	2	(1D)	2D 12.2%
2.5	2	962.249	---	1	(3P)	4F 38.9%	1	(3P)	4D 16.7%
2.5	3	980.946	---	2	(1D)	2D 52.1%	1	(1D)	2D 16.1%
2.5	4	1040.733	---	1	(1D)	2F 35.8%	1	(3P)	4F 33.0%
2.5	5	1136.511	---	1	(3P)	4D 31.4%	1	(3P)	4F 17.4%
2.5	6	1196.492	---	1	(3P)	4P 45.1%	1	(3P)	4D 19.9%
2.5	7	1274.228	---	1	(3P)	2D 41.8%	1	(3P)	2F 18.8%
2.5	8	1364.396	---	1	(1D)	2D 28.8%	1	(1D)	2F 16.4%
2.5	9	1416.132	---	1	(1S)	2D 51.2%	1	(3P)	2D 17.7%
2.5	10	1514.801	---	1	(3P)	2D 29.1%	1	(1S)	2D 21.1%
3.5	1	1069.000	---	1	(3P)	4F 65.6%	1	(1D)	2G 18.5%
3.5	2	1081.468	---	1	(3P)	4D 49.4%	1	(1D)	2F 21.3%
3.5	3	1198.902	---	1	(1D)	2G 57.8%	1	(3P)	4F 15.1%
3.5	4	1284.274	---	1	(1D)	2F 37.1%	1	(3P)	4D 36.0%
3.5	5	1401.111	---	1	(3P)	2F 61.4%	1	(1D)	2F 23.2%
4.5	1	1121.338	---	1	(3P)	4F 61.7%	1	(1D)	2G 37.1%
4.5	2	1308.949	---	1	(1D)	2G 61.6%	1	(3P)	4F 36.9%



Mo XXVIII　スペクトル・パターン

$(3s)^2\ (3p)^3 - (3s)^2\ (2p)^2\ (3d)$

$(3s)\ (3p)^4$

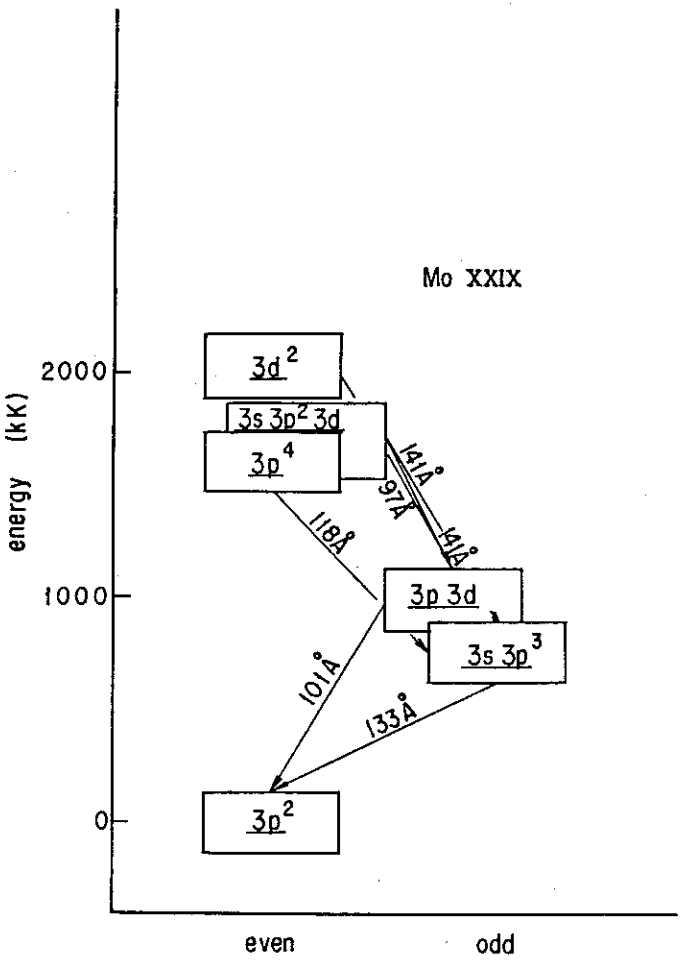
Mo XXVIII 波長，振動子強度

$(3s)^2(3p)^3 - (3s)^2(3p)^2(3d)$

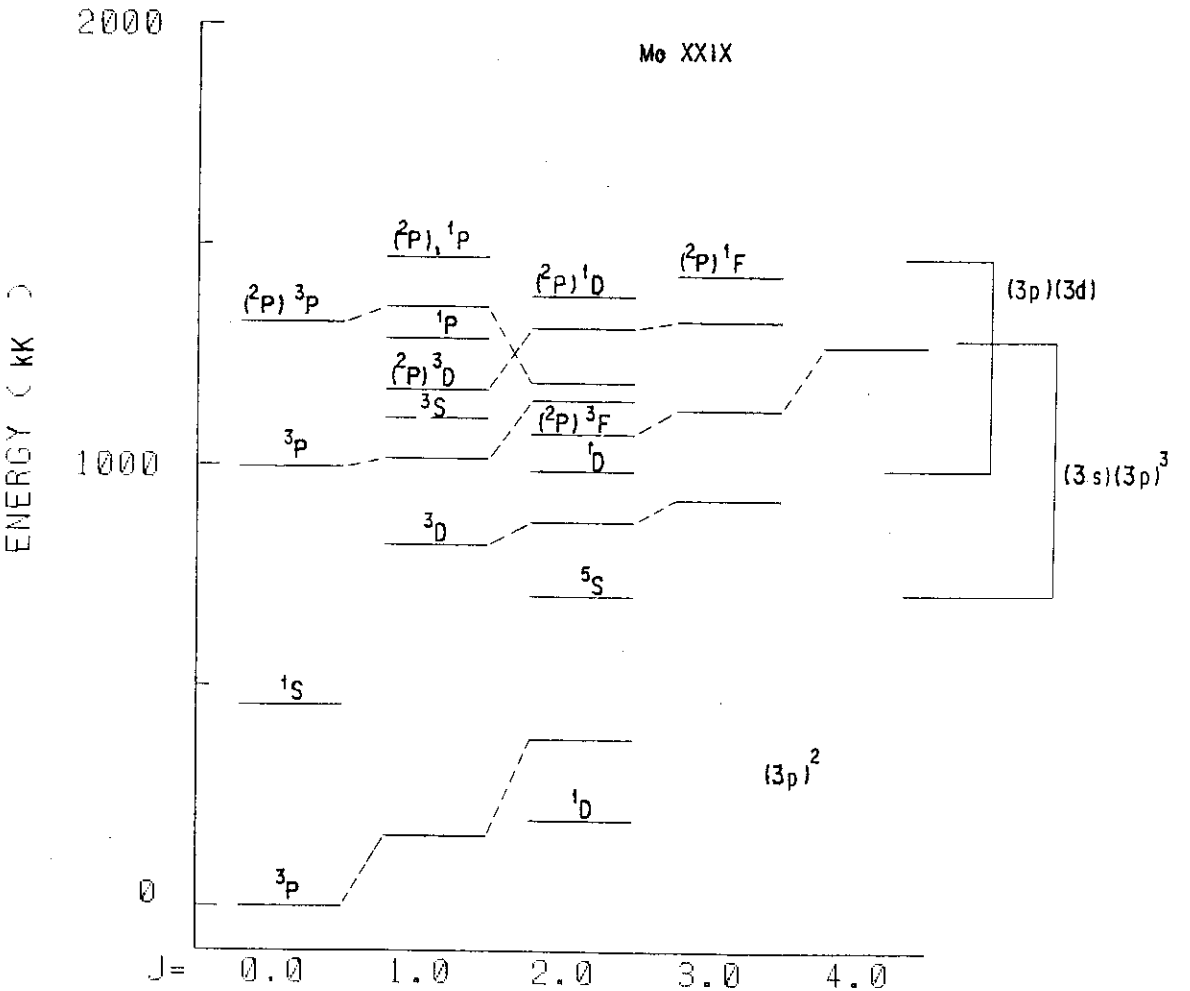
$(3s)(3p)^4$

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
1	406.598	1.5	814.387	1.5	245.225	0.0060	0.6671E+09
2	406.598	1.5	835.806	0.5	232.987	0.0019	0.2347E+09
3	406.598	1.5	896.522	1.5	204.113	0.0029	0.4658E+09
4	199.307	2.5	732.015	2.5	187.720	0.0363	0.6871E+10
5	406.598	1.5	962.249	2.5	179.969	0.0135	0.2770E+10
6	406.598	1.5	980.946	2.5	174.110	0.0550	0.1211E+11
7	156.940	1.5	732.015	2.5	173.890	0.0693	0.1529E+11
8	249.963	0.5	835.806	0.5	170.694	0.0278	0.6368E+10
9	406.598	1.5	1012.254	1.5	165.110	0.0131	0.3216E+10
10	406.598	1.5	1018.164	0.5	163.514	0.0049	0.1229E+10
11	199.307	2.5	814.387	1.5	162.581	0.0357	0.9015E+10
12	406.598	1.5	1040.732	2.5	157.695	0.0023	0.6157E+09
13	156.940	1.5	814.387	1.5	152.103	0.0080	0.2301E+10
14	406.598	1.5	1083.682	0.5	147.692	0.0028	0.8594E+09
15	406.598	1.5	1106.008	1.5	142.978	0.0143	0.4663E+10
16	249.963	0.5	949.744	1.5	142.902	0.0061	0.1997E+10
17	406.598	1.5	1136.511	2.5	137.003	0.0118	0.4182E+10
18	-0.003	1.5	732.015	2.5	136.609	0.0761	0.2721E+11
19	156.940	1.5	896.522	1.5	135.211	0.0163	0.5941E+10
20	199.307	2.5	949.744	1.5	133.256	0.0132	0.4961E+10
21	249.963	0.5	1012.254	1.5	131.183	0.0064	0.2490E+10
22	199.307	2.5	962.249	2.5	131.072	0.0127	0.4939E+10
23	249.963	0.5	1018.164	0.5	130.174	0.0240	0.9441E+10
24	406.598	1.5	1182.801	1.5	128.832	0.0129	0.5191E+10
25	199.307	2.5	980.946	2.5	127.936	0.1373	0.5595E+11
26	156.940	1.5	949.744	1.5	126.134	0.1477	0.6190E+11
27	406.598	1.5	1203.268	0.5	125.522	0.0220	0.9304E+10
28	156.940	1.5	962.249	2.5	124.176	0.0040	0.1741E+10
29	199.307	2.5	1012.254	1.5	123.009	0.0628	0.2769E+11
30	406.598	1.5	1220.697	1.5	122.835	0.0320	0.1414E+11
31	-0.003	1.5	814.387	1.5	122.791	0.1177	0.5206E+11
32	406.598	1.5	1223.369	0.5	122.433	0.0496	0.2206E+11
33	249.963	0.5	1083.682	0.5	119.944	0.0450	0.2084E+11
34	-0.003	1.5	835.806	0.5	119.645	0.0748	0.3487E+11
35	199.307	2.5	1040.732	2.5	118.846	0.0147	0.6952E+10
36	249.963	0.5	1106.008	1.5	116.816	0.0186	0.9104E+10
37	156.940	1.5	1018.164	0.5	116.114	0.0377	0.1865E+11
38	406.598	1.5	1274.227	2.5	115.257	0.0147	0.7381E+10
39	199.307	2.5	1068.999	3.5	114.983	0.0064	0.3253E+10
40	-0.003	1.5	896.522	1.5	111.542	0.0455	0.2438E+11
41	199.307	2.5	1106.008	1.5	110.290	0.1631	0.8944E+11
42	406.598	1.5	1319.635	0.5	109.525	0.0686	0.3815E+11
43	156.940	1.5	1083.682	0.5	107.905	0.0968	0.5548E+11
44	249.963	0.5	1182.801	1.5	107.200	0.0226	0.1312E+11
45	406.598	1.5	1343.223	0.5	106.766	0.0246	0.1439E+11
46	199.307	2.5	1136.511	2.5	106.700	0.0566	0.3316E+11
47	156.940	1.5	1106.008	1.5	105.366	0.0533	0.3202E+11
48	-0.003	1.5	949.744	1.5	105.291	0.0810	0.4873E+11
49	406.598	1.5	1359.486	1.5	104.944	0.0038	0.2317E+10
50	249.963	0.5	1203.268	0.5	104.898	0.0319	0.1932E+11

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
51	406.598	1.5	1364.395	2.5	104.406	0.0656	0.4015E+11
52	-0.003	1.5	962.249	2.5	103.923	0.1273	0.7860E+11
53	249.963	0.5	1220.697	1.5	103.015	0.0089	0.5574E+10
54	249.963	0.5	1223.369	0.5	102.732	0.0135	0.8534E+10
55	156.940	1.5	1136.511	2.5	102.085	0.1216	0.7783E+11
56	-0.003	1.5	980.946	2.5	101.942	0.0239	0.1534E+11
57	199.307	2.5	1182.801	1.5	101.678	0.2614	0.1686E+12
58	199.307	2.5	1196.492	2.5	100.282	0.2391	0.1586E+12
59	199.307	2.5	1198.901	3.5	100.041	0.2743	0.1828E+12
60	249.963	0.5	1251.323	1.5	99.864	0.1487	0.9943E+11
61	406.598	1.5	1416.132	2.5	99.056	0.0090	0.6129E+10
62	-0.003	1.5	1018.164	0.5	98.216	0.0222	0.1533E+11
63	199.307	2.5	1220.697	1.5	97.906	0.4845	0.3371E+12
64	156.940	1.5	1182.801	1.5	97.479	0.1628	0.1143E+12
65	406.598	1.5	1442.258	1.5	96.557	0.2552	0.1826E+12
66	156.940	1.5	1196.492	2.5	96.195	0.0932	0.6716E+11
67	-0.003	1.5	1040.732	2.5	96.086	0.0076	0.5500E+10
68	156.940	1.5	1203.268	0.5	95.572	0.0285	0.2080E+11
69	199.307	2.5	1251.323	1.5	95.056	0.0181	0.1336E+11
70	406.598	1.5	1470.104	0.5	94.029	0.6164	0.4650E+12
71	156.940	1.5	1220.697	1.5	94.006	0.2635	0.1989E+12
72	156.940	1.5	1223.369	0.5	93.771	0.0039	0.2931E+10
73	249.963	0.5	1319.635	0.5	93.487	0.4555	0.3477E+12
74	199.307	2.5	1274.227	2.5	93.030	0.3467	0.2672E+12
75	-0.003	1.5	1083.682	0.5	92.278	0.0203	0.1588E+11
76	199.307	2.5	1284.273	3.5	92.169	0.0333	0.2618E+11
77	406.598	1.5	1499.485	1.5	91.501	0.6101	0.4861E+12
78	249.963	0.5	1343.223	0.5	91.470	0.0103	0.8199E+10
79	-0.003	1.5	1106.008	1.5	90.415	0.0487	0.3976E+11
80	406.598	1.5	1514.800	2.5	90.236	1.5865	0.1300E+13
81	249.963	0.5	1359.486	1.5	90.129	0.1087	0.8928E+11
82	156.940	1.5	1274.227	2.5	89.503	0.8549	0.7118E+12
83	-0.003	1.5	1136.511	2.5	87.988	0.2106	0.1815E+12
84	199.307	2.5	1359.486	1.5	86.194	0.3042	0.2731E+12
85	156.940	1.5	1319.635	0.5	86.007	0.0820	0.7398E+11
86	199.307	2.5	1364.395	2.5	85.830	1.0053	0.9102E+12
87	-0.003	1.5	1182.801	1.5	84.545	0.8221	0.7671E+12
88	156.940	1.5	1343.223	0.5	84.297	0.3654	0.3430E+12
89	249.963	0.5	1442.258	1.5	83.872	0.6507	0.6169E+12
90	-0.003	1.5	1196.492	2.5	83.578	1.0921	0.1043E+13
91	199.307	2.5	1401.111	3.5	83.208	2.0772	0.2001E+13
92	156.940	1.5	1359.486	1.5	83.157	0.7111	0.6859E+12
93	-0.003	1.5	1203.268	0.5	83.107	0.2369	0.2288E+12
94	156.940	1.5	1364.395	2.5	82.819	0.5770	0.5611E+12
95	199.307	2.5	1416.132	2.5	82.181	0.0175	0.1732E+11
96	-0.003	1.5	1220.697	1.5	81.920	0.2920	0.2902E+12
97	-0.003	1.5	1223.369	0.5	81.741	0.2350	0.2345E+12
98	249.963	0.5	1499.485	1.5	80.031	0.2803	0.2919E+12
99	-0.003	1.5	1251.323	1.5	79.915	0.1055	0.1102E+12
100	-0.003	1.5	1274.227	2.5	78.479	0.2978	0.3225E+12
101	156.940	1.5	1442.258	1.5	77.802	0.0125	0.1373E+11
102	156.940	1.5	1470.104	0.5	76.152	0.0250	0.2872E+11
103	199.307	2.5	1514.800	2.5	76.017	0.0302	0.3484E+11
104	156.940	1.5	1514.800	2.5	73.645	0.0161	0.1985E+11



Mo XXIX　グロトリアン・ダイアグラム



Mo XXIX　エネルギーレベル
$(3s)^2\ (3p)^2$, $(3s)\ (3p)^3$, $(3s)^2\ (3p)\ (3d)$

Mo XXIX エネルギー レベル

EVEN $(3s)^2\ (3p)^2$

ODD 1 $(3s)^2\ (3p)\ (3d)$

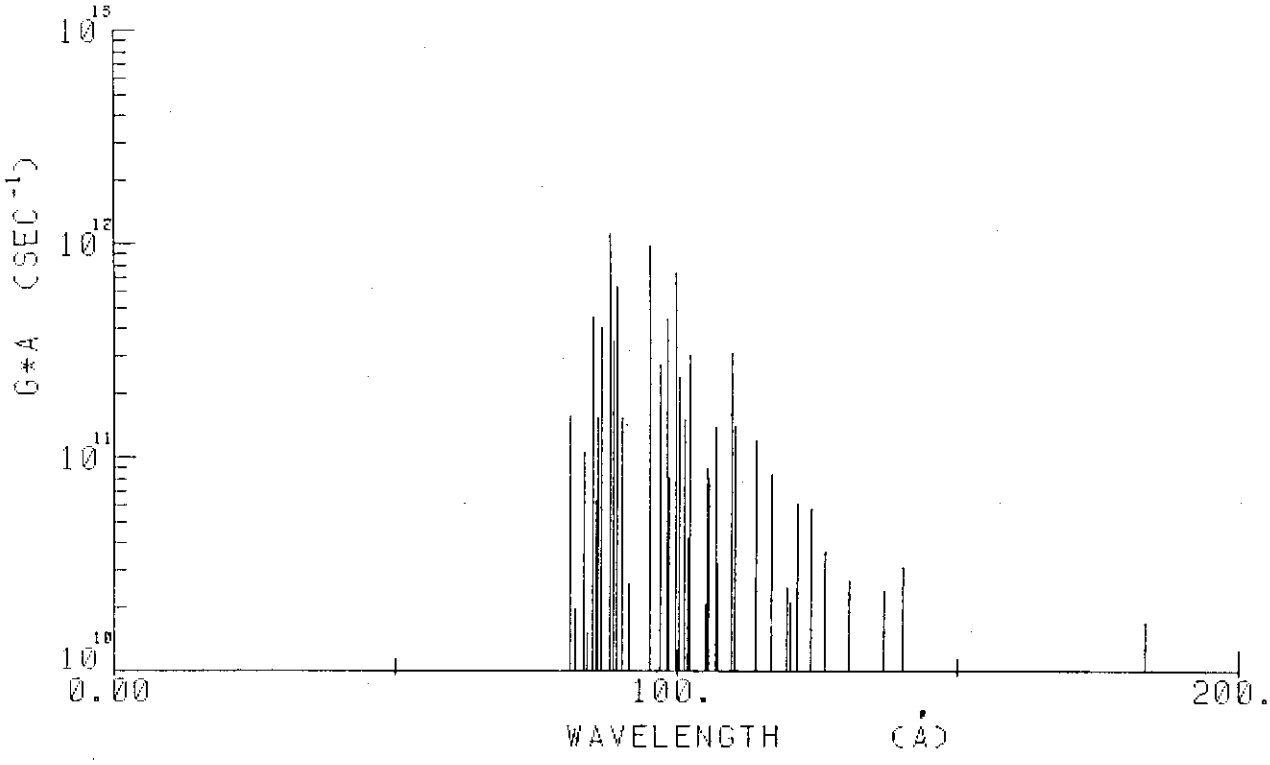
2 $(3s)\ (3p)^3$

EVEN PARITY

J	NO	ENERGY(KK)		LEADING PERCENTAGES					
0.0	1	0.001	---	1	3P	77.8%	1	1S	20.7%
0.0	2	458.315	---	1	1S	76.8%	1	3P	20.7%
1.0	1	162.788	---	1	3P	98.4%			
2.0	1	196.753	---	1	1D	51.6%	1	3P	46.8%
2.0	2	383.320	---	1	3P	51.4%	1	1D	46.7%

ODD PARITY

J	NO	ENERGY(KK)		LEADING PERCENTAGES							
0.0	1	998.331	---	2	(2P)	3P	90.9%	1	(2P)	3P	7.9%
0.0	2	1326.716	---	1	(2P)	3P	90.2%	2	(2P)	3P	7.9%
1.0	1	823.409	---	2	(2D)	3D	55.7%	2	(2P)	3P	20.1%
1.0	2	1018.621	---	2	(2P)	3P	58.4%	2	(2D)	3D	18.9%
1.0	3	1108.004	---	2	(4S)	3S	47.0%	2	(2P)	1P	32.3%
1.0	4	1175.982	---	1	(2P)	3D	41.3%	1	(2P)	3P	21.2%
1.0	5	1289.559	---	2	(2P)	1P	30.7%	2	(4S)	3S	24.9%
1.0	6	1361.699	---	1	(2P)	3P	47.9%	2	(2P)	1P	10.9%
1.0	7	1475.948	---	1	(2P)	1P	67.2%	2	(2P)	1P	12.6%
2.0	1	707.226	---	2	(4S)	5S	66.7%	2	(2P)	3P	23.9%
2.0	2	875.651	---	2	(2D)	3D	54.6%	2	(4S)	5S	22.6%
2.0	3	988.242	---	1	(2P)	1D	27.8%	1	(2P)	3F	25.8%
2.0	4	1073.829	---	1	(2P)	3F	57.1%	2	(2D)	3D	13.6%
2.0	5	1149.339	---	2	(2P)	3P	36.9%	1	(2P)	1D	25.9%
2.0	6	1191.405	---	1	(2P)	3P	51.8%	2	(2D)	1D	27.4%
2.0	7	1315.742	---	1	(2P)	3D	43.1%	1	(2P)	1D	26.5%
2.0	8	1384.426	---	1	(2P)	3P	36.1%	1	(2P)	3D	17.8%
3.0	1	927.844	---	2	(2D)	3D	87.9%	1	(2P)	3D	10.2%
3.0	2	1130.817	---	1	(2P)	3F	82.8%	1	(2P)	3D	6.4%
3.0	3	1331.425	---	1	(2P)	3D	60.3%	1	(2P)	1F	17.1%
3.0	4	1432.240	---	1	(2P)	1F	74.6%	1	(2P)	3D	21.5%
4.0	1	1272.586	---	1	(2P)	3F	98.5%				



Mo XXIX　スペクトルパターン

$(3s)^2\ (3p)^2 - (3s)^2\ (3p)\ (3d)$

$(3s)\ (3p)^3$

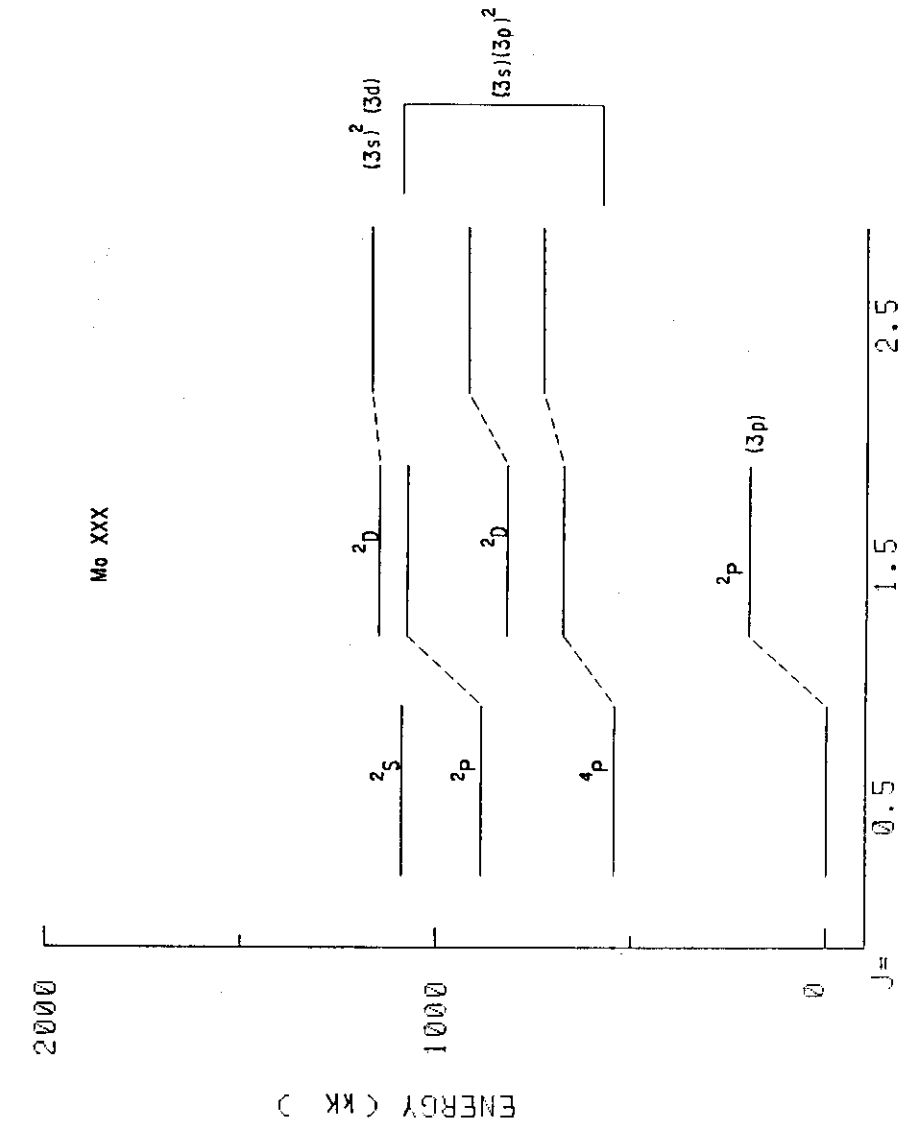
Mo XXIX　波長，振動子強度

$(3s)^2(3p)^2-(3s)(3p)(3d)$

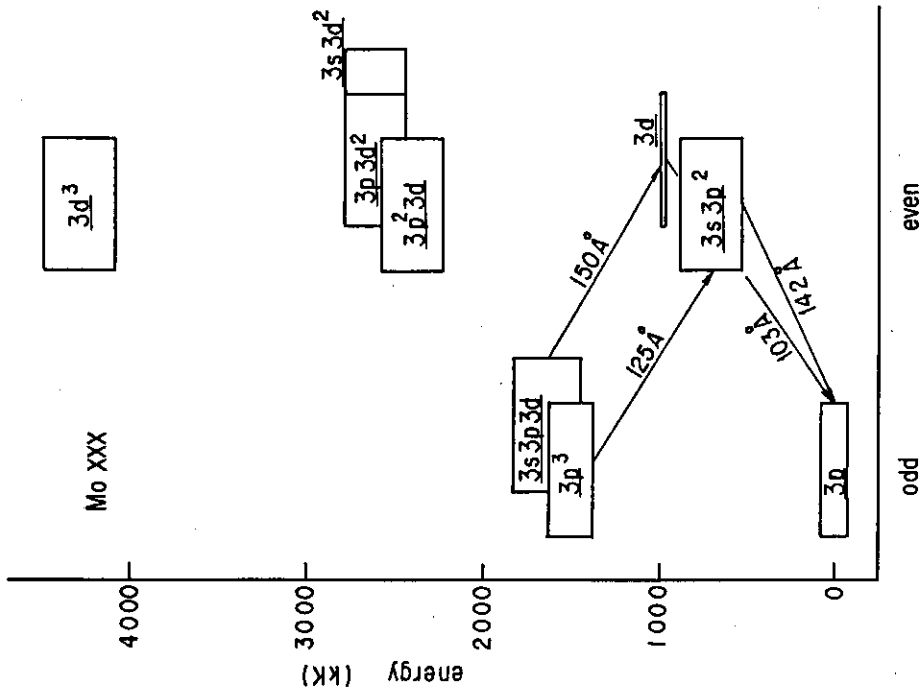
$(3s)(3p)^3$

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
1	383.320	2.0	707.226	2.0	308.731	0.0016	0.1146E+09
2	383.320	2.0	823.409	1.0	227.227	0.0071	0.9213E+09
3	383.320	2.0	875.651	2.0	203.115	0.0057	0.9265E+09
4	196.753	2.0	707.226	2.0	195.897	0.0287	0.4994E+10
5	162.788	1.0	707.226	2.0	183.676	0.0394	0.7792E+10
6	383.320	2.0	927.844	3.0	183.646	0.0855	0.1691E+11
7	458.315	0.0	1018.621	1.0	178.474	0.0139	0.2917E+10
8	383.320	2.0	988.241	2.0	165.311	0.0220	0.5373E+10
9	196.753	2.0	823.409	1.0	159.577	0.0364	0.9532E+10
10	383.320	2.0	1018.621	1.0	157.406	0.0040	0.1082E+10
11	458.315	0.0	1108.003	1.0	153.920	0.0213	0.6010E+10
12	162.788	1.0	823.409	1.0	151.373	0.0034	0.9809E+09
13	196.753	2.0	875.651	2.0	147.297	0.0048	0.1483E+10
14	383.320	2.0	1073.829	2.0	144.821	0.0085	0.2713E+10
15	162.788	1.0	875.651	2.0	140.279	0.0911	0.3087E+11
16	458.315	0.0	1175.982	1.0	139.340	0.0063	0.2152E+10
17	383.320	2.0	1108.003	1.0	137.991	0.0167	0.5834E+10
18	196.753	2.0	927.844	3.0	136.782	0.0668	0.2380E+11
19	383.320	2.0	1130.817	3.0	133.780	0.0070	0.2624E+10
20	383.320	2.0	1149.339	2.0	130.545	0.0687	0.2687E+11
21	196.753	2.0	988.241	2.0	126.344	0.0881	0.3683E+11
22	383.320	2.0	1191.405	2.0	123.749	0.1340	0.5838E+11
23	196.753	2.0	1018.621	1.0	121.674	0.0029	0.1319E+10
24	0.001	0.0	823.409	1.0	121.447	0.1358	0.6142E+11
25	458.315	0.0	1289.558	1.0	120.302	0.0454	0.2094E+11
26	162.788	1.0	998.331	0.0	119.683	0.0535	0.2490E+11
27	162.788	1.0	1018.621	1.0	116.845	0.1723	0.8415E+11
28	196.753	2.0	1073.829	2.0	114.015	0.2362	0.1212E+12
29	458.315	0.0	1361.699	1.0	110.695	0.0113	0.6160E+10
30	383.320	2.0	1289.558	1.0	110.346	0.2563	0.1404E+12
31	162.788	1.0	1073.829	2.0	109.765	0.0252	0.1397E+11
32	196.753	2.0	1108.003	1.0	109.739	0.5584	0.3093E+12
33	383.320	2.0	1315.742	2.0	107.248	0.0559	0.3240E+11
34	196.753	2.0	1130.817	3.0	107.059	0.2397	0.1395E+12
35	162.788	1.0	1108.003	1.0	105.796	0.1353	0.8064E+11
36	383.320	2.0	1331.424	3.0	105.474	0.1512	0.9065E+11
37	196.753	2.0	1149.339	2.0	104.977	0.0339	0.2055E+11
38	383.320	2.0	1361.699	1.0	102.210	0.4789	0.3057E+12
39	196.753	2.0	1175.982	1.0	102.121	0.0669	0.4276E+11
40	162.788	1.0	1149.339	2.0	101.363	0.2328	0.1511E+12
41	196.753	2.0	1191.405	2.0	100.538	0.3663	0.2417E+12
42	383.320	2.0	1384.425	2.0	99.890	1.0941	0.7314E+12
43	162.788	1.0	1175.982	1.0	98.698	0.1186	0.8122E+11
44	458.315	0.0	1475.947	1.0	98.267	0.6468	0.4467E+12
45	0.001	0.0	1018.621	1.0	98.172	0.0466	0.3225E+11
46	162.788	1.0	1191.405	2.0	97.218	0.3847	0.2715E+12
47	383.320	2.0	1432.240	3.0	95.336	1.3584	0.9969E+12
48	383.320	2.0	1475.947	1.0	91.523	0.0270	0.2151E+11
49	196.753	2.0	1289.558	1.0	91.508	0.0322	0.2567E+11
50	0.001	0.0	1108.003	1.0	90.253	0.1894	0.1551E+12

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
51	196.753	2.0	1315.742	2.0	89.366	0.7593	0.6341E+12
52	162.788	1.0	1289.558	1.0	88.749	0.4165	0.3527E+12
53	196.753	2.0	1331.424	3.0	88.131	1.3088	0.1124E+13
54	162.788	1.0	1315.742	2.0	86.734	0.4577	0.4058E+12
55	162.788	1.0	1326.715	0.0	85.916	0.1714	0.1549E+12
56	196.753	2.0	1361.699	1.0	85.841	0.0707	0.6400E+11
57	0.001	0.0	1175.982	1.0	85.035	0.4932	0.4549E+12
58	196.753	2.0	1384.425	2.0	84.198	0.0162	0.1522E+11
59	162.788	1.0	1361.699	1.0	83.409	0.1115	0.1069E+12
60	162.788	1.0	1384.425	2.0	81.857	0.0197	0.1962E+11
61	196.753	2.0	1432.240	3.0	80.940	0.1531	0.1559E+12
62	162.788	1.0	1475.947	1.0	76.152	0.0062	0.7077E+10



Mo XXX エネルギー・レベル
$(3s)^2(3p)$, $(3s)(3p)^2$, $(3s)^2(3d)$



Mo XXX グロトリアン・ダイアグラム

Mo XXX エネルギーレベル

ODD $(3s)^2(3p)$

EVEN 1 $(3s)(3p)^2$

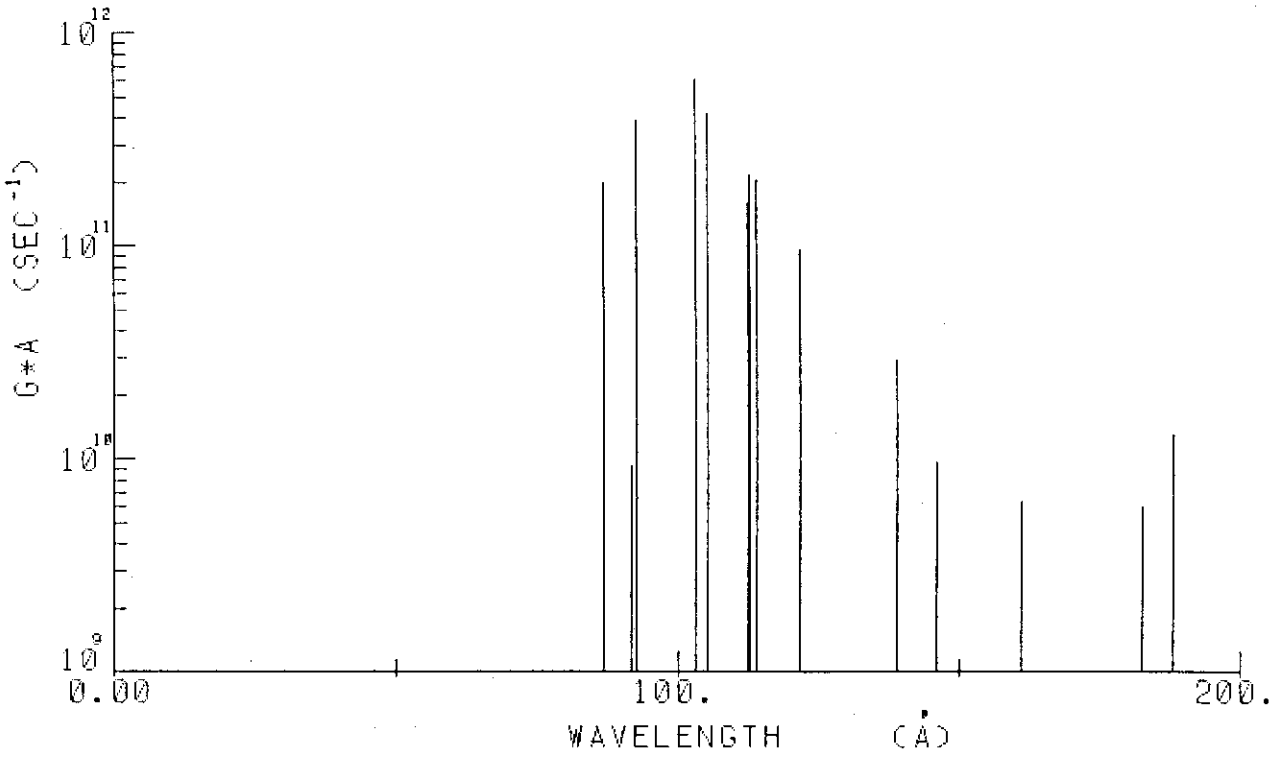
2 $(3s)^2(3d)$

ODD PARITY

J	NO	ENERGY(KK)		LEADING PERCENTAGES	
0.5	1	0.001	---	1 2P 98.6%	
1.5	1	200.442	---	1 2P 98.2%	

EVEN PARITY

J	NO	ENERGY(KK)		LEADING PERCENTAGES	
0.5	1	547.363	---	2 (3P) 4P 81.7%	2 (1S) 2S 14.5%
0.5	2	886.023	---	2 (3P) 2P 68.7%	2 (1S) 2S 17.6%
0.5	3	1088.696	---	2 (1S) 2S 66.9%	2 (3P) 2P 26.0%
1.5	1	677.149	---	2 (3P) 4P 96.0%	2 (1D) 2D 2.7%
1.5	2	821.378	---	2 (1D) 2D 75.4%	2 (3P) 2P 11.6%
1.5	3	1077.975	---	2 (3P) 2P 58.9%	1 2D 37.9%
1.5	4	1148.792	---	1 2D 50.1%	2 (3P) 2P 26.6%
2.5	1	731.719	---	2 (3P) 4P 63.7%	2 (1D) 2D 33.8%
2.5	2	920.540	---	2 (1D) 2D 53.1%	2 (3P) 4P 35.1%
2.5	3	1169.217	---	1 2D 85.4%	2 (1D) 2D 12.1%



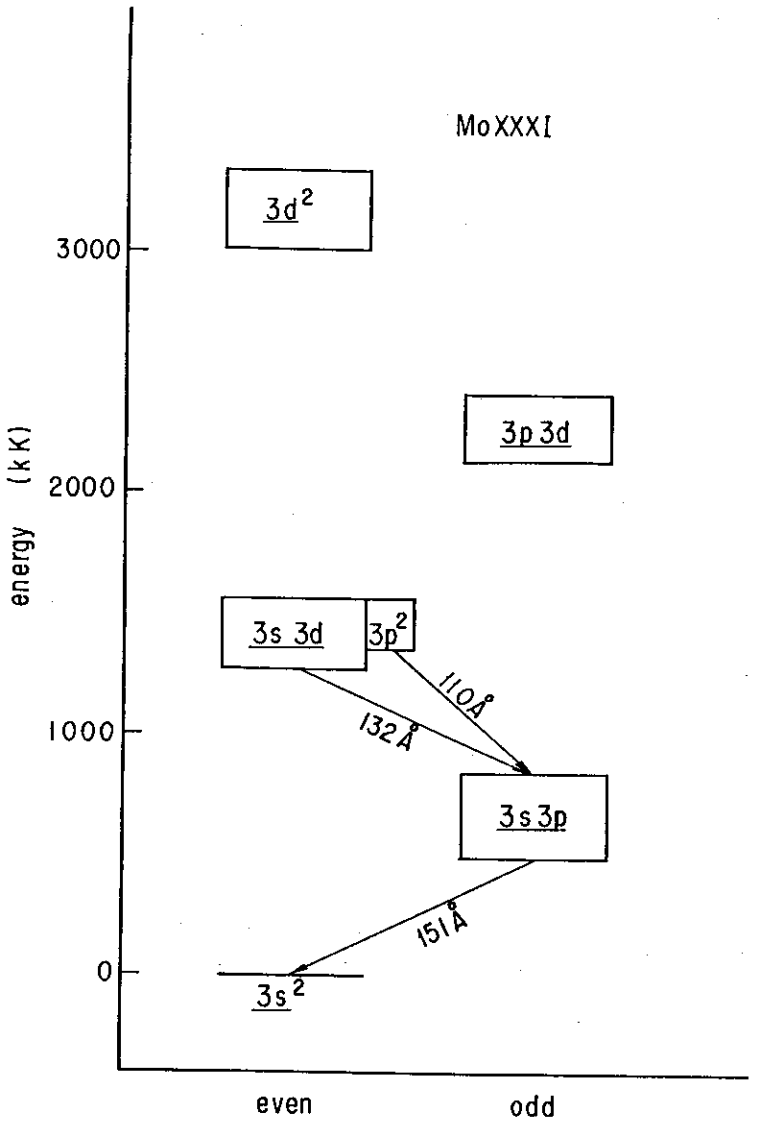
Mo XXX　スペクトル・パターン

$$\frac{(3s)^2\,(3p) - (3s)\,(3p)\,(3d)}{(3s)\,(3p)^2}$$

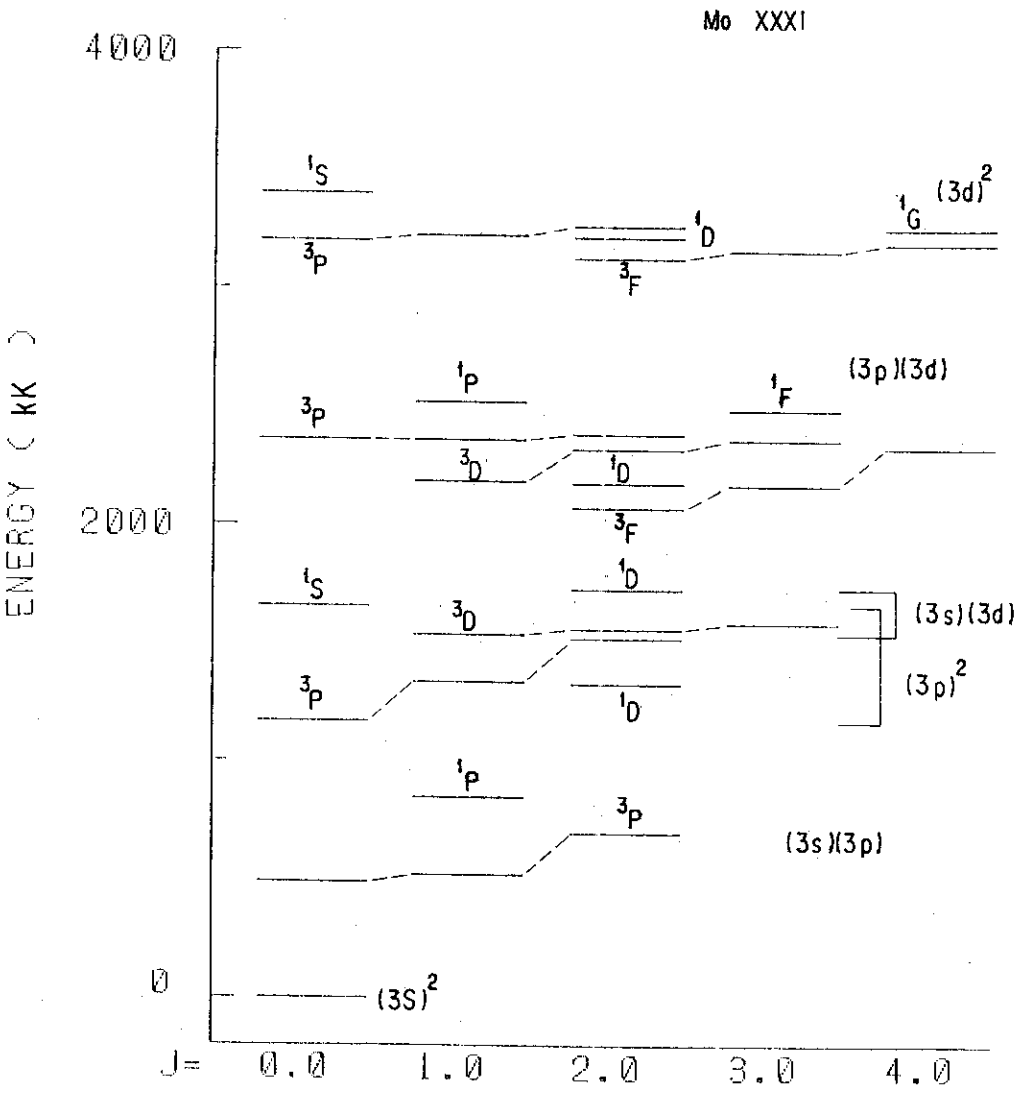
Mo XXX　波長，振動子強度

$$\frac{(3s)^2\,(3p) - (3s)\,(3p)\,(3d)}{(3s)\,(3p)^2}$$

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
1	200.442	1.5	547.363	0.5	288.250	0.0019	0.1512E+09
2	200.442	1.5	677.149	1.5	209.772	0.0074	0.1128E+10
3	200.442	1.5	731.719	2.5	188.225	0.0690	0.1298E+11
4	0.001	0.5	547.363	0.5	182.694	0.0304	0.6069E+10
5	200.442	1.5	821.377	1.5	161.047	0.0245	0.6311E+10
6	200.442	1.5	886.023	0.5	145.862	0.0309	0.9683E+10
7	200.442	1.5	920.540	2.5	138.870	0.0844	0.2919E+11
8	0.001	0.5	821.377	1.5	121.747	0.2171	0.9768E+11
9	200.442	1.5	1077.974	1.5	113.956	0.4039	0.2075E+12
10	0.001	0.5	886.023	0.5	112.864	0.4192	0.2195E+12
11	200.442	1.5	1088.695	0.5	112.580	0.3023	0.1591E+12
12	200.442	1.5	1148.791	1.5	105.446	0.7037	0.4221E+12
13	200.442	1.5	1169.216	2.5	103.223	0.9802	0.6136E+12
14	0.001	0.5	1077.974	1.5	92.767	0.5132	0.3978E+12
15	0.001	0.5	1088.695	0.5	91.853	0.0118	0.9335E+10
16	0.001	0.5	1148.791	1.5	87.048	0.2285	0.2011E+12



Mo XXXI　グロトリアン・ダイアグラム



Mo XXXI　エネルギー レベル

$(3s)^2$, $(3s)(3p)^2$, $(3s)(3d)$, $(3p)(3d)$, $(3d)^2$

Mo XXXI　エネルギーレベル

EVEN 1　$(3s)^2$
2　(3s) (3d)
3　$(3p)^2$
4　$(3d)^2$

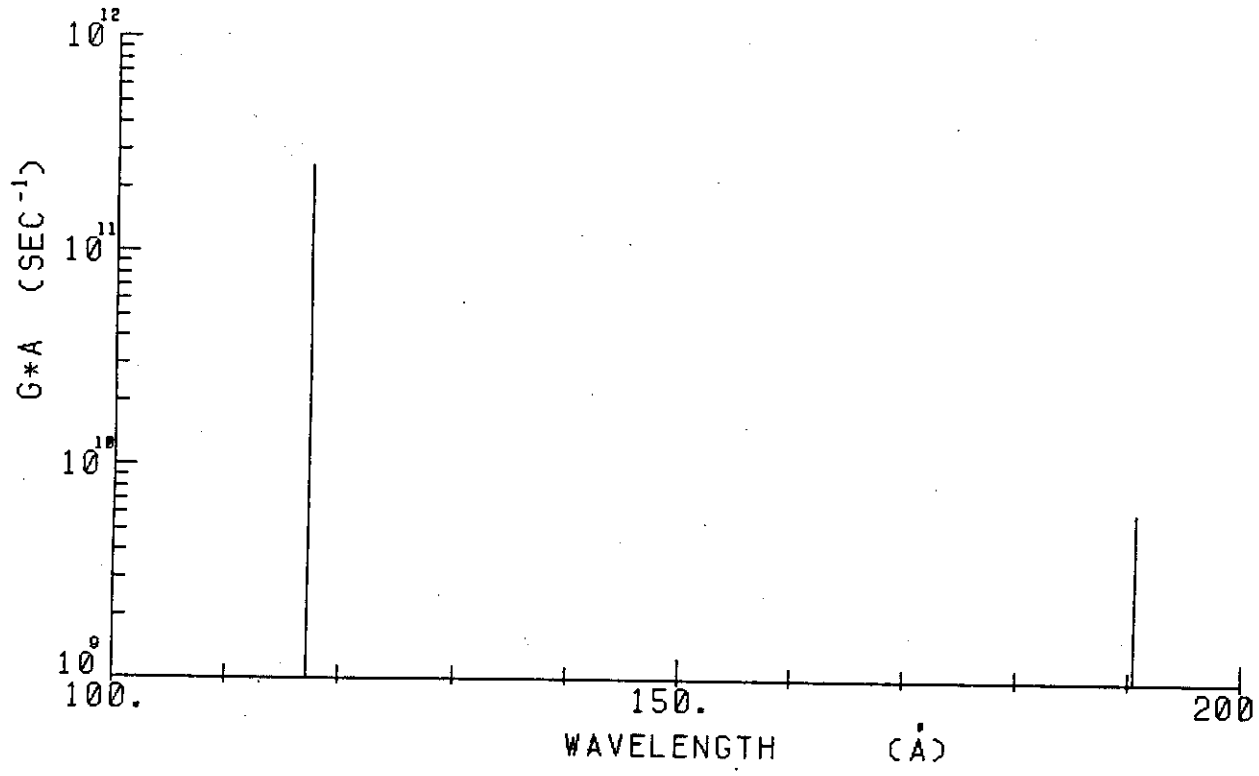
ODD 1　(3s) (3p)
2　(3p) (3d)

EVEN PARITY

J	NO	ENERGY(KK)		LEADING PERCENTAGES			
0.0	1	0.0	---	1	1S 98.6%	3	1S 1.3%
0.0	2	1169.648	---	3	3P 79.7%	3	1S 19.5%
0.0	3	1657.087	---	3	1S 77.9%	3	3P 20.1%
0.0	4	3205.948	---	4	3P 93.7%	4	1S 6.0%
0.0	5	3402.336	---	4	1S 92.6%	4	3P 6.1%
1.0	1	1337.224	---	3	3P 99.8%		
1.0	2	1543.412	---	2	3D100.0%		
1.0	3	3227.514	---	4	3P 99.8%		
2.0	1	1334.700	---	3	1D 59.2%	3	3P 28.6%
2.0	2	1520.242	---	3	3P 63.5%	2	1D 18.4%
2.0	3	1563.293	---	2	3D 92.8%	3	3P 4.0%
2.0	4	1734.646	---	2	1D 69.3%	3	1D 25.1%
2.0	5	3129.152	---	4	3F 91.4%	4	1D 8.1%
2.0	6	3217.956	---	4	1D 48.4%	4	3P 44.7%
2.0	7	3271.260	---	4	3P 54.6%	4	1D 43.0%
3.0	1	1591.887	---	2	3D100.0%		
3.0	2	3166.313	---	4	3F100.0%		
4.0	1	3197.608	---	4	3F 89.2%	4	1G 10.8%
4.0	2	3258.583	---	4	1G 89.2%	4	3F 10.8%

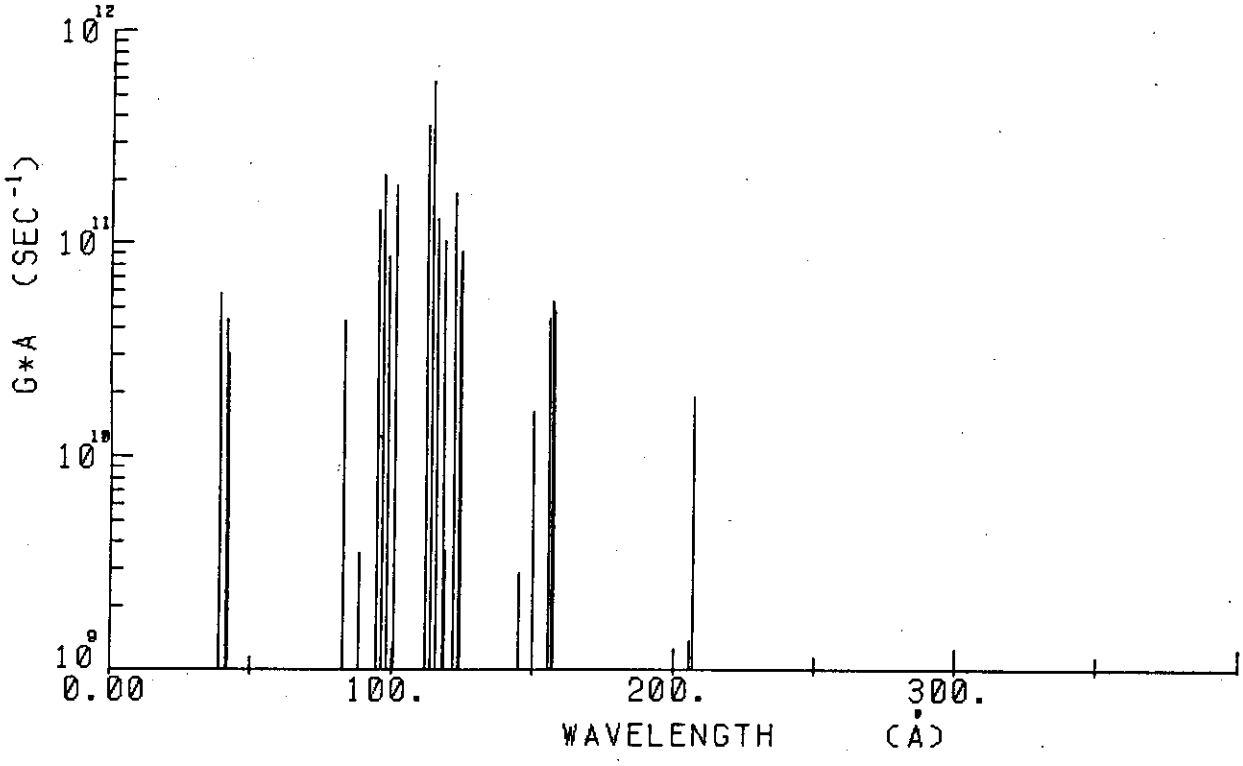
ODD PARITY

J	NO	ENERGY(KK)		LEADING PERCENTAGES			
0.0	1	488.125	---	1	3P 99.9%		
0.0	2	2364.491	---	2	3P 99.9%		
1.0	1	524.887	---	1	3P 89.7%	1	1P 10.0%
1.0	2	851.948	---	1	1P 88.6%	1	3P 10.1%
1.0	3	2187.626	---	2	3D 65.6%	2	3P 19.5%
1.0	4	2367.352	---	2	3P 72.8%	2	3D 26.2%
1.0	5	2520.646	---	2	1P 83.1%	2	3D 8.2%
2.0	1	697.775	---	1	3P 99.8%		
2.0	2	2076.410	---	2	3F 77.9%	2	1D 19.2%
2.0	3	2183.217	---	2	3P 39.6%	2	1D 27.3%
2.0	4	2321.758	---	2	3D 41.0%	2	1D 40.6%
2.0	5	2390.215	---	2	3P 56.5%	2	3D 30.4%
3.0	1	2170.365	---	2	3F 80.0%	2	3D 12.9%
3.0	2	2364.405	---	2	3D 71.0%	2	3F 18.8%
3.0	3	2491.161	---	2	1F 82.7%	2	3D 16.1%
4.0	1	2329.051	---	2	3F100.0%		



Mo XXXI　スペクトル・パターン

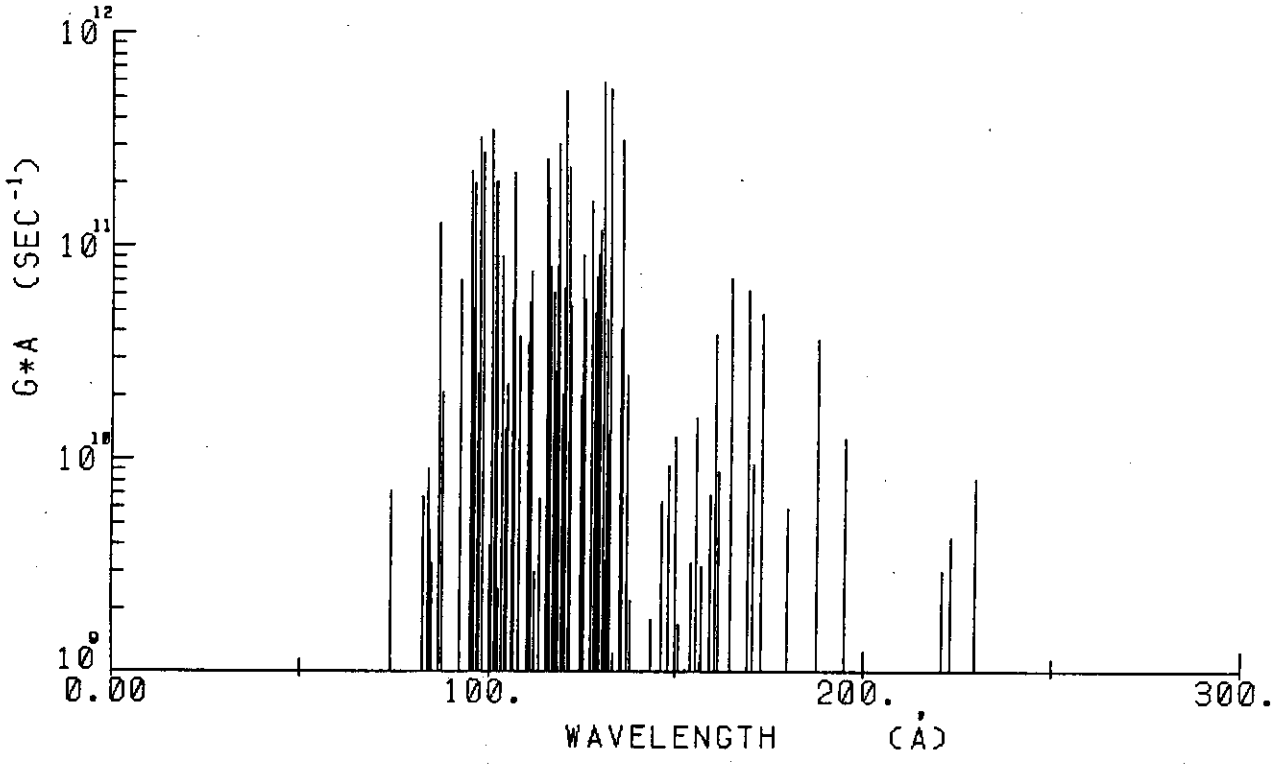
$(3s)^2 - (3s)(3p)$



Mo XXXI　スペクトル・パターン

$(3s)(3p) - (3s)(3d)$

$(3p)^2$



Mo XXXI　スペクトル・パターン

(3s)(3d)－(3p)(3d)

$(3p)^2$ －(3p)(3d)

(3p)(3d)－$(3d)^2$

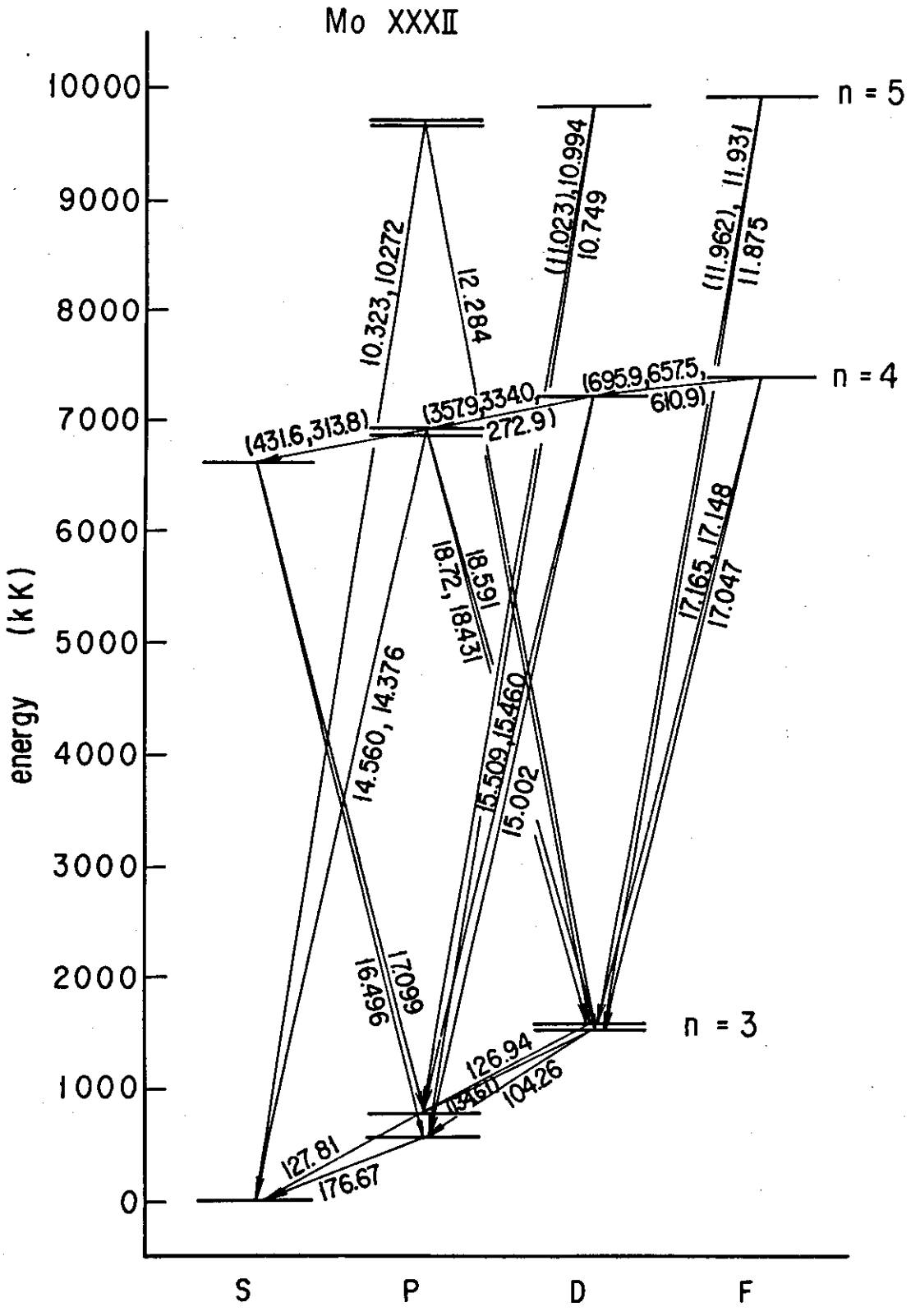
Mo XXXI　波長，振動子強度

n = 3 － 3

NO	EVEN PARITY (KK)	J	ODD PARITY (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
1	1169.648	0.0	851.948	1.0	314.762	0.0027	0.1794E+09
2	1734.646	2.0	2076.409	2.0	292.600	0.0083	0.6495E+09
3	1734.646	2.0	2170.364	3.0	229.506	0.0638	0.8073E+10
4	1734.646	2.0	2183.216	2.0	222.931	0.0324	0.4354E+10
5	1734.646	2.0	2187.626	1.0	220.760	0.0217	0.2971E+10
6	1334.700	2.0	851.948	1.0	207.146	0.1236	0.1922E+11
7	1337.224	1.0	851.948	1.0	206.068	0.0089	0.1392E+10
8	1563.293	2.0	2076.409	2.0	194.888	0.0711	0.1249E+11
9	0.0	0.0	524.886	1.0	190.517	0.0339	0.6221E+10
10	1543.412	1.0	2076.409	2.0	187.618	0.1945	0.3686E+11
11	1520.241	2.0	2076.409	2.0	179.802	0.0289	0.5967E+10
12	1591.886	3.0	2170.364	3.0	172.867	0.2162	0.4825E+11
13	1734.646	2.0	2321.758	2.0	170.325	0.0416	0.9561E+10
14	1591.886	3.0	2183.216	2.0	169.110	0.2685	0.6263E+11
15	1563.293	2.0	2170.364	3.0	164.725	0.2916	0.7168E+11
16	3129.152	2.0	2520.645	1.0	164.337	0.0263	0.6493E+10
17	1563.293	2.0	2183.216	2.0	161.310	0.0347	0.8891E+10
18	1563.293	2.0	2187.626	1.0	160.171	0.1487	0.3866E+11
19	1734.646	2.0	2364.404	3.0	158.791	0.0258	0.6820E+10
20	1334.700	2.0	697.774	2.0	157.004	0.1772	0.4795E+11
21	3129.152	2.0	2491.161	3.0	156.742	0.0116	0.3155E+10
22	1337.224	1.0	697.774	2.0	156.385	0.1973	0.5382E+11
23	1543.412	1.0	2183.216	2.0	156.298	0.0040	0.1105E+10
24	1543.412	1.0	2187.626	1.0	155.228	0.0564	0.1560E+11
25	1169.648	0.0	524.886	1.0	155.096	0.1632	0.4526E+11
26	1520.241	2.0	2170.364	3.0	153.817	0.0117	0.3299E+10
27	1734.646	2.0	2390.215	2.0	152.539	0.0036	0.1027E+10
28	1520.241	2.0	2183.216	2.0	150.835	0.0058	0.1699E+10
29	1520.241	2.0	2187.626	1.0	149.839	0.0428	0.1271E+11
30	1520.241	2.0	851.948	1.0	149.635	0.0549	0.1634E+11
31	3166.312	3.0	2491.161	3.0	148.115	0.0308	0.9359E+10
32	3205.947	0.0	2520.645	1.0	145.921	0.0203	0.6371E+10
33	1543.412	1.0	851.948	1.0	144.621	0.0090	0.2870E+10
34	3217.955	2.0	2520.645	1.0	143.408	0.0055	0.1800E+10
35	1657.086	0.0	2367.352	1.0	140.792	0.0026	0.8674E+09
36	3217.955	2.0	2491.161	3.0	137.591	0.0062	0.2188E+10
37	1591.886	3.0	2321.758	2.0	137.010	0.0705	0.2506E+11
38	1591.886	3.0	2329.050	4.0	135.655	0.8727	0.3163E+12
39	3129.152	2.0	2390.215	2.0	135.330	0.0266	0.9680E+10
40	1337.224	1.0	2076.409	2.0	135.284	0.0038	0.1396E+10
41	1334.700	2.0	2076.409	2.0	134.824	0.1125	0.4129E+11
42	3271.259	2.0	2520.645	1.0	133.224	0.0033	0.1243E+10
43	1734.646	2.0	2491.161	3.0	132.185	1.4366	0.5484E+12
44	1563.293	2.0	2321.758	2.0	131.845	0.0339	0.1300E+11
45	3129.152	2.0	2367.352	1.0	131.268	0.1181	0.4573E+11
46	3129.152	2.0	2364.404	3.0	130.762	0.0086	0.3342E+10
47	3258.583	4.0	2491.161	3.0	130.306	1.4951	0.5873E+12
48	1591.886	3.0	2364.404	3.0	129.447	0.3005	0.1196E+12
49	3166.312	3.0	2390.215	2.0	128.850	0.2286	0.9183E+11
50	1543.412	1.0	2321.758	2.0	128.478	0.1809	0.7308E+11

NO	EVEN PARITY (KK)	J	ODD PARITY (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
51	3271.259	2.0	2491.161	3.0	128.189	0.1216	0.4935E+11
52	1734.646	2.0	2520.645	1.0	127.227	0.3951	0.1628E+12
53	1591.886	3.0	2390.215	2.0	125.262	0.1350	0.5739E+11
54	1563.293	2.0	2364.404	3.0	124.827	0.2162	0.9255E+11
55	1520.241	2.0	2321.758	2.0	124.763	0.0491	0.2105E+11
56	1563.293	2.0	2367.352	1.0	124.369	0.0466	0.2011E+11
57	1657.086	0.0	851.948	1.0	124.202	0.2135	0.9232E+11
58	1334.700	2.0	524.886	1.0	123.485	0.1716	0.7504E+11
59	1337.224	1.0	524.886	1.0	123.102	0.1376	0.6055E+11
60	1543.412	1.0	2364.491	0.0	121.791	0.1182	0.5314E+11
61	1520.241	2.0	697.774	2.0	121.586	0.3829	0.1727E+12
62	1543.412	1.0	2367.352	1.0	121.368	0.2575	0.1166E+12
63	1563.293	2.0	2390.215	2.0	120.930	0.5149	0.2349E+12
64	3197.607	4.0	2364.404	3.0	120.019	1.1632	0.5386E+12
65	1334.700	2.0	2170.364	3.0	119.665	0.1365	0.6356E+11
66	3166.312	3.0	2329.050	4.0	119.437	0.0368	0.1719E+11
67	3227.514	1.0	2390.215	2.0	119.432	0.0175	0.8183E+10
68	3205.947	0.0	2367.352	1.0	119.247	0.0437	0.2049E+11
69	1520.241	2.0	2364.404	3.0	118.461	0.6431	0.3057E+12
70	3166.312	3.0	2321.758	2.0	118.406	0.4304	0.2048E+12
71	1543.412	1.0	697.774	2.0	118.254	0.0077	0.3664E+10
72	1337.224	1.0	2183.216	2.0	118.204	0.3383	0.1615E+12
73	1543.412	1.0	2390.215	2.0	118.091	0.0463	0.2215E+11
74	1520.241	2.0	2367.352	1.0	118.048	0.1353	0.6476E+11
75	1334.700	2.0	2183.216	2.0	117.853	0.1690	0.8115E+11
76	1337.224	1.0	488.125	0.0	117.772	0.2126	0.1022E+12
77	1337.224	1.0	2187.626	1.0	117.591	0.0538	0.2594E+11
78	3217.955	2.0	2367.352	1.0	117.564	0.0123	0.5933E+10
79	0.0	0.0	851.948	1.0	117.378	0.5247	0.2540E+12
80	3217.955	2.0	2364.404	3.0	117.158	0.1265	0.6147E+11
81	3227.514	1.0	2367.352	1.0	116.257	0.1649	0.8139E+11
82	3227.514	1.0	2364.491	0.0	115.872	0.1618	0.8040E+11
83	1657.086	0.0	2520.645	1.0	115.800	0.3812	0.1896E+12
84	1563.293	2.0	697.774	2.0	115.538	0.2603	0.1300E+12
85	3197.607	4.0	2329.050	4.0	115.133	0.5100	0.2566E+12
86	1520.241	2.0	2390.215	2.0	114.946	0.3522	0.1778E+12
87	3402.336	0.0	2520.645	1.0	113.418	0.0127	0.6583E+10
88	1734.646	2.0	851.948	1.0	113.289	1.1271	0.5857E+12
89	1591.886	3.0	697.774	2.0	111.843	0.6718	0.3582E+12
90	3258.583	4.0	2364.404	3.0	111.834	0.0057	0.3017E+10
91	1591.886	3.0	2491.161	3.0	111.201	0.1422	0.7670E+11
92	3227.514	1.0	2321.758	2.0	110.405	0.1011	0.5532E+11
93	3271.259	2.0	2364.404	3.0	110.271	0.0638	0.3500E+11
94	1563.293	2.0	2491.161	3.0	107.774	0.0548	0.3145E+11
95	3258.583	4.0	2329.050	4.0	107.581	0.0663	0.3821E+11
96	3129.152	2.0	2187.626	1.0	106.211	0.3776	0.2232E+12
97	3129.152	2.0	2183.216	2.0	105.715	0.0942	0.5622E+11
98	1563.293	2.0	2520.645	1.0	104.455	0.0370	0.2261E+11
99	3129.152	2.0	2170.364	3.0	104.298	0.0229	0.1405E+11
100	1520.241	2.0	2491.161	3.0	102.995	0.1445	0.9088E+11

NO	EVEN PARITY (KK)	J	ODD PARITY (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
101	1543.412	1.0	2520.645	1.0	102.330	0.0039	0.2504E+10
102	3166.312	3.0	2183.216	2.0	101.719	0.2046	0.1319E+12
103	1337.224	1.0	2321.758	2.0	101.571	0.3143	0.2032E+12
104	1334.700	2.0	2321.758	2.0	101.311	0.3055	0.1985E+12
105	1520.241	2.0	524.886	1.0	100.467	0.2851	0.1884E+12
106	3166.312	3.0	2170.364	3.0	100.407	0.5327	0.3525E+12
107	1520.241	2.0	2520.645	1.0	99.960	0.0060	0.3978E+10
108	1169.648	0.0	2187.626	1.0	98.234	0.3995	0.2761E+12
109	3205.947	0.0	2187.626	1.0	98.201	0.1620	0.1120E+12
110	1543.412	1.0	524.886	1.0	98.181	0.1251	0.8655E+11
111	3197.607	4.0	2170.364	3.0	97.348	0.1274	0.8968E+11
112	1337.224	1.0	2364.491	0.0	97.346	0.1001	0.7045E+11
113	1334.700	2.0	2364.404	3.0	97.115	0.4617	0.3265E+12
114	1337.224	1.0	2367.352	1.0	97.075	0.2229	0.1578E+12
115	3217.955	2.0	2187.626	1.0	97.056	0.0236	0.1674E+11
116	1334.700	2.0	2367.352	1.0	96.838	0.0357	0.2538E+11
117	3217.955	2.0	2183.216	2.0	96.643	0.0074	0.5269E+10
118	1734.646	2.0	697.774	2.0	96.444	0.0210	0.1506E+11
119	1563.293	2.0	524.886	1.0	96.301	0.2955	0.2125E+12
120	3227.514	1.0	2183.216	2.0	95.758	0.2723	0.1980E+12
121	3217.955	2.0	2170.364	3.0	95.457	0.0695	0.5091E+11
122	3129.152	2.0	2076.409	2.0	94.990	0.3088	0.2283E+12
123	1337.224	1.0	2390.215	2.0	94.968	0.0314	0.2324E+11
124	1543.412	1.0	488.125	0.0	94.761	0.1914	0.1421E+12
125	1334.700	2.0	2390.215	2.0	94.740	0.0303	0.2252E+11
126	3271.259	2.0	2187.626	1.0	92.282	0.0076	0.5981E+10
127	3258.583	4.0	2170.364	3.0	91.893	0.0887	0.7009E+11
128	1657.086	0.0	524.886	1.0	88.324	0.0041	0.3540E+10
129	3217.955	2.0	2076.409	2.0	87.600	0.0237	0.2064E+11
130	1334.700	2.0	2491.161	3.0	86.471	0.1447	0.1291E+12
131	1337.224	1.0	2520.645	1.0	84.501	0.0035	0.3272E+10
132	1334.700	2.0	2520.645	1.0	84.321	0.0050	0.4687E+10
133	3271.259	2.0	2076.409	2.0	83.693	0.0095	0.9025E+10
134	1734.646	2.0	524.886	1.0	82.661	0.0446	0.4353E+11
135	3402.336	0.0	2187.626	1.0	82.324	0.0069	0.6790E+10
136	1169.648	0.0	2520.645	1.0	74.019	0.0058	0.7095E+10
137	3217.955	2.0	851.948	1.0	42.265	0.0081	0.3029E+11
138	3271.259	2.0	851.948	1.0	41.334	0.0113	0.4398E+11
139	3402.336	0.0	851.948	1.0	39.210	0.0135	0.5844E+11



Mo XXXII　グロトリアン・ダイアグラム

Mo XXXII　エネルギーレベル

EVEN 1　(3s)
2　(3d)
3　(4s)
4　(4d)

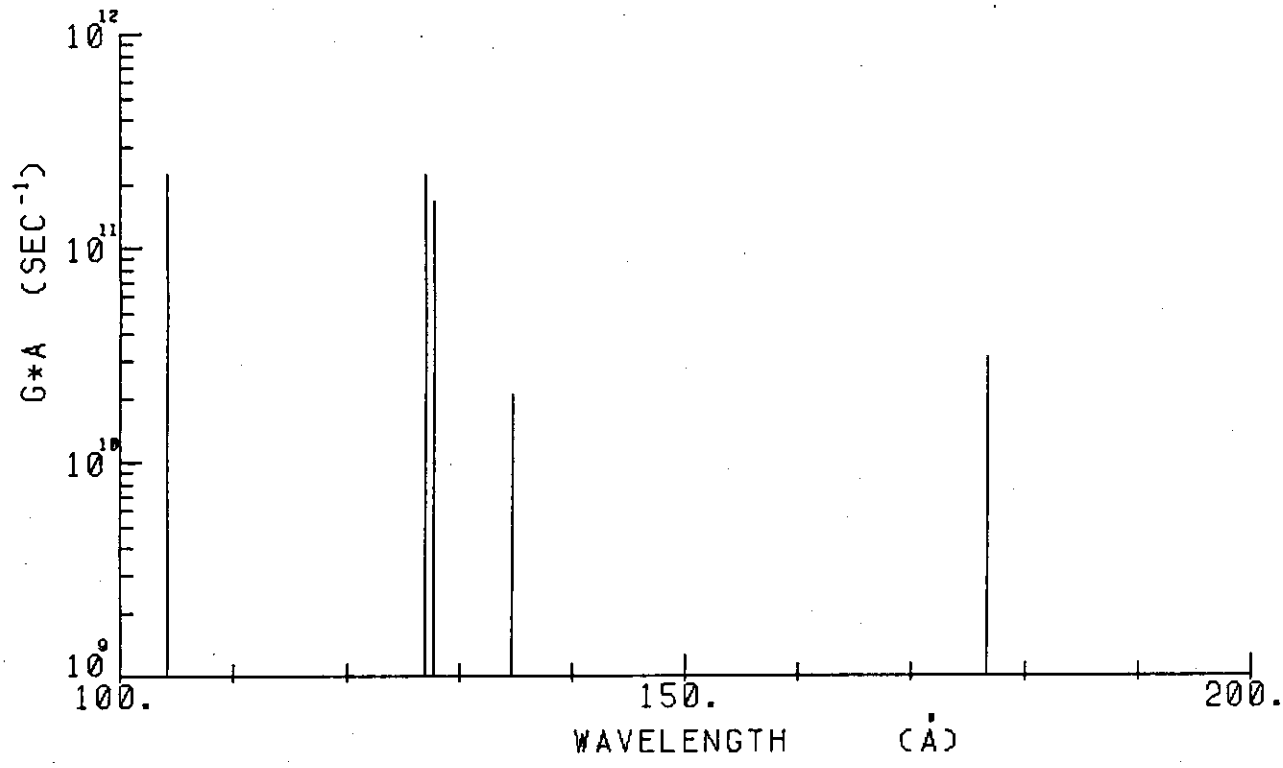
ODD　1　(3p)
2　(4p)
3　(4f)

EVEN PARITY

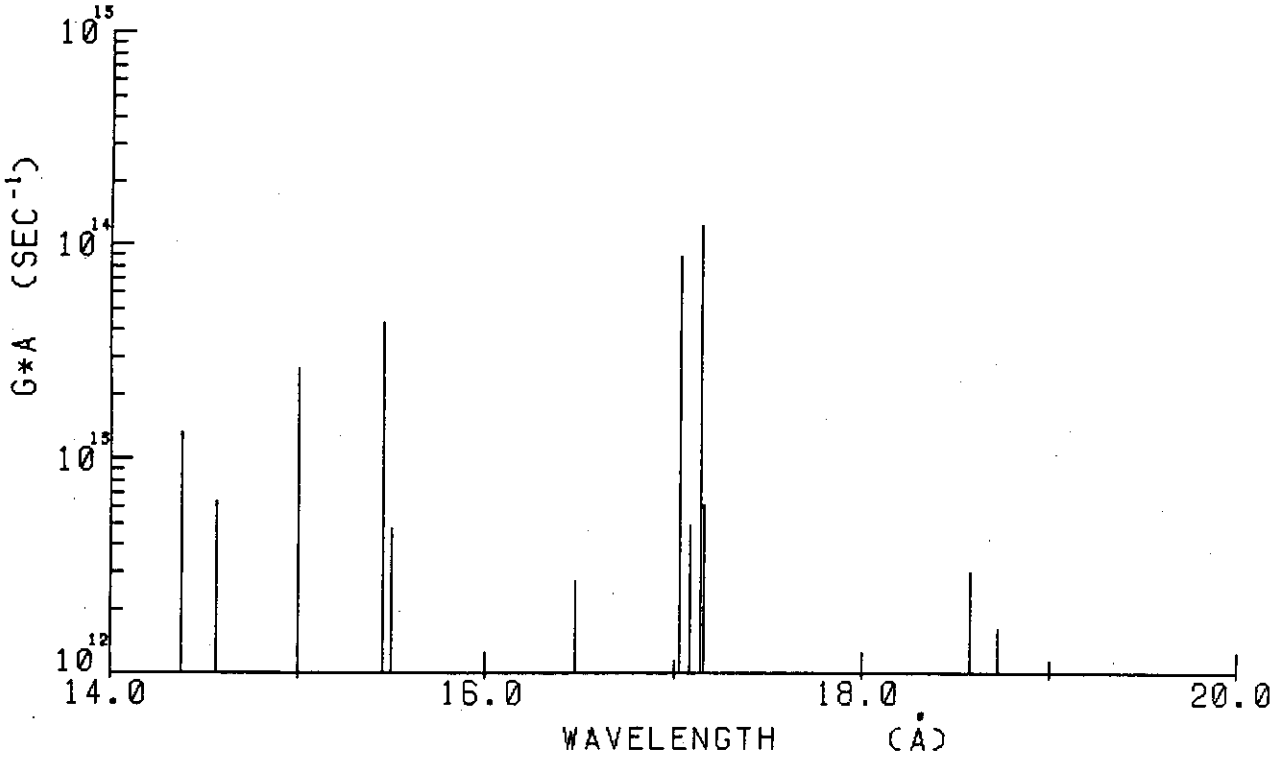
J	NO	ENERGY(KK)		LEADING PERCENTAGES	
0.5	1	0.0	---	1	2S100.0%
0.5	2	6634.301	---	3	2S100.0%
1.5	1	1525.200	---	2	2D100.0%
1.5	2	7232.398	---	4	2D100.0%
2.5	1	1570.200	---	2	2D100.0%
2.5	2	7252.398	---	4	2D100.0%

ODD PARITY

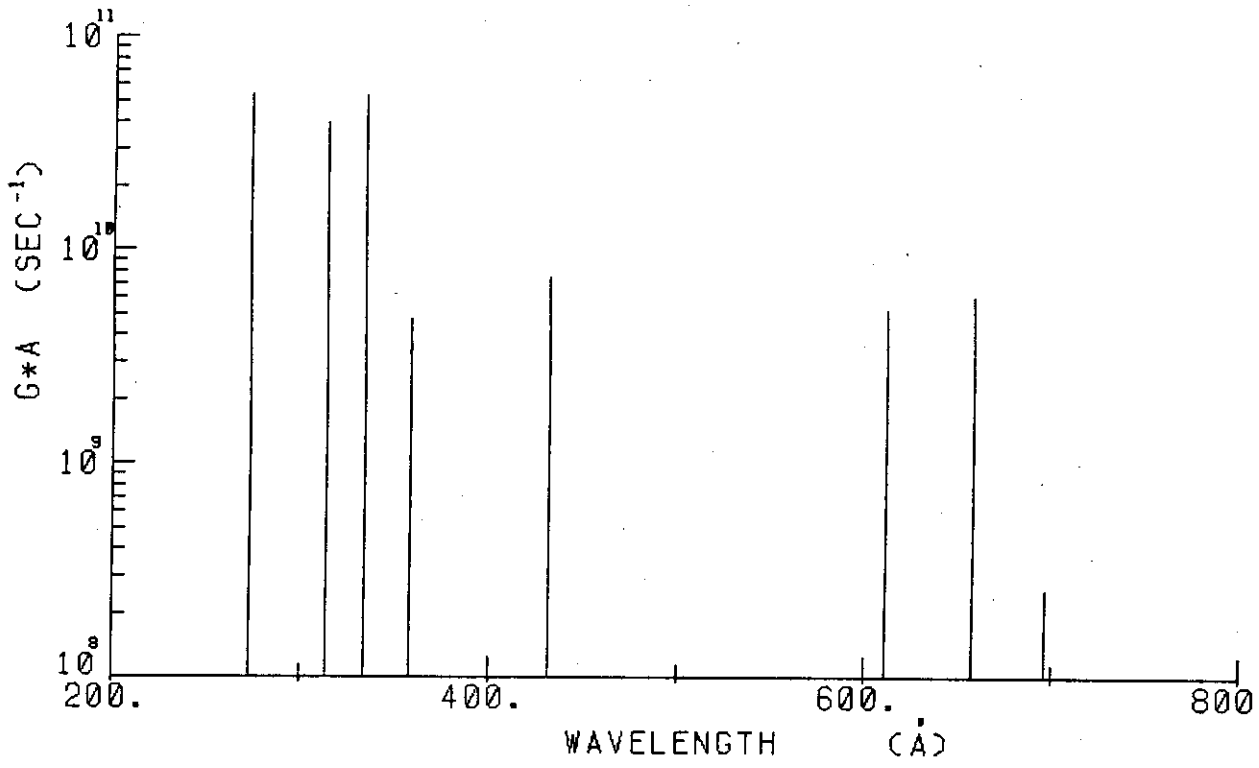
J	NO	ENERGY(KK)		LEADING PERCENTAGES	
0.5	1	566.190	---	1	2P100.0%
0.5	2	6866.000	---	2	2P100.0%
1.5	1	782.385	---	1	2P100.0%
1.5	2	6952.996	---	2	2P100.0%
2.5	1	7396.098	---	3	2F100.0%
3.5	1	7404.496	---	3	2F100.0%



Mo XXXII　スペクトル・パターン
n ＝3－3



Mo XXXII　スペクトル・パターン
n ＝3－4

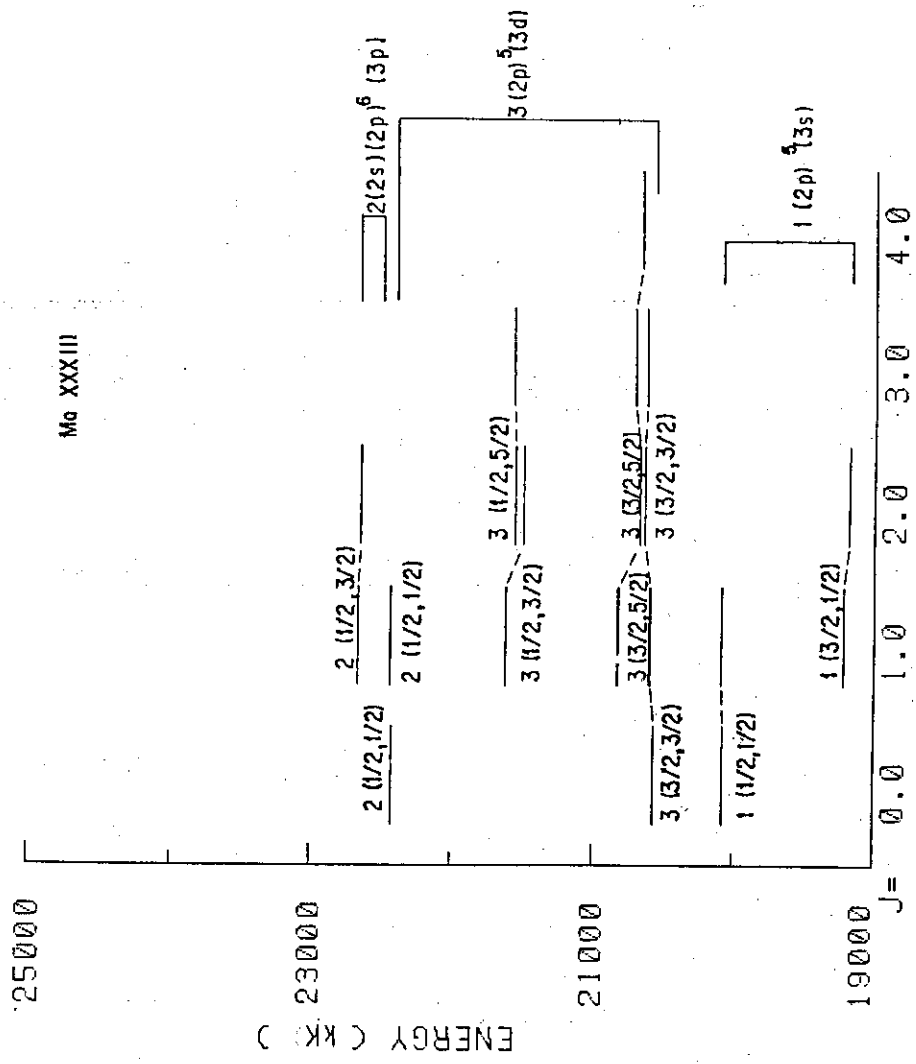


Mo XXXII　スペクトル・パターン
n＝4－4

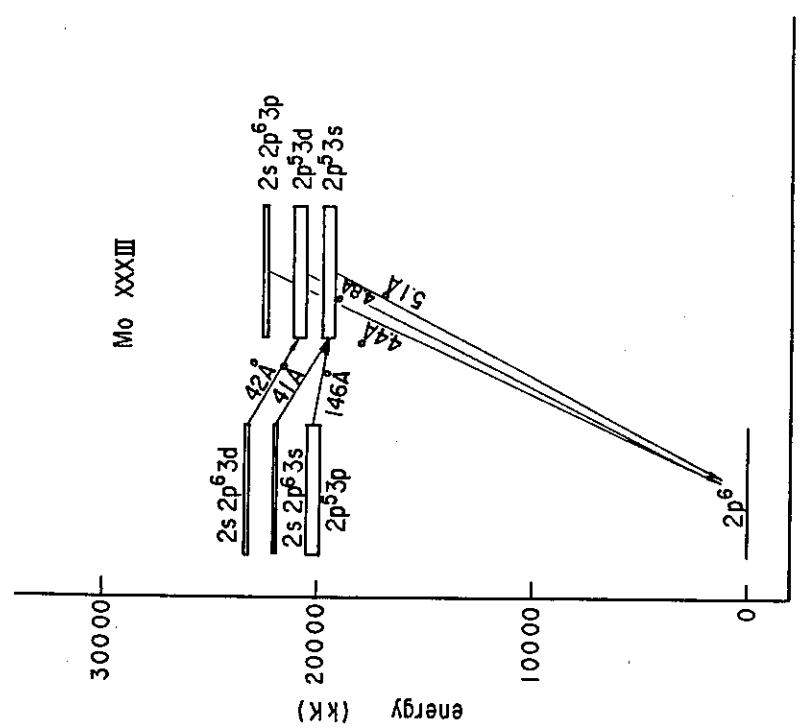
Mo XXXII　波長，振動子強度

n ＝ 3 － 4

NO	EVEN PARITY (KK)	J	ODD PARITY (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
1	7252.395	2.5	7396.094	2.5	695.899	0.0187	2.582E+08
2	7252.395	2.5	7404.492	3.5	657.471	0.3969	6.124E+09
3	7232.395	1.5	7396.094	2.5	610.877	0.2990	5.344E+09
4	6634.297	0.5	6866.000	0.5	431.593	0.2107	7.545E+09
5	7232.395	1.5	6952.992	1.5	357.907	0.0913	4.753E+09
6	7252.395	2.5	6952.992	1.5	333.999	0.8804	5.264E+10
7	6634.297	0.5	6952.992	1.5	313.779	0.5797	3.927E+10
8	7232.395	1.5	6866.000	0.5	272.927	0.5985	5.359E+10
9	0.0	0.5	566.190	0.5	176.619	0.1460	3.122E+10
10	1525.199	1.5	782.385	1.5	134.623	0.0561	2.063E+10
11	0.0	0.5	782.385	1.5	127.814	0.4035	1.647E+11
12	1570.199	2.5	782.385	1.5	126.933	0.5352	2.215E+11
13	1525.199	1.5	566.190	0.5	104.274	0.3619	2.220E+11
14	1525.199	1.5	6866.000	0.5	18.724	0.0858	1.633E+12
15	1570.199	2.5	6952.992	1.5	18.578	0.1557	3.009E+12
16	1570.199	2.5	7396.094	2.5	17.165	0.2717	6.150E+12
17	1570.199	2.5	7404.492	3.5	17.140	5.4409	1.235E+14
18	6634.297	0.5	782.385	1.5	17.088	0.2155	4.923E+12
19	1525.199	1.5	7396.094	2.5	17.033	3.8326	8.811E+13
20	6634.297	0.5	566.190	0.5	16.480	0.1117	2.744E+12
21	7232.395	1.5	782.385	1.5	15.504	0.1718	4.767E+12
22	7252.395	2.5	782.385	1.5	15.456	1.5511	4.331E+13
23	7232.395	1.5	566.190	0.5	15.001	0.8879	2.632E+13
24	0.0	0.5	6866.000	0.5	14.565	0.2025	6.366E+12
25	0.0	0.5	6952.992	1.5	14.382	0.4100	1.322E+13



Mo XXXIII エネルギーレベル
$(2p)^5$ (3s), (2s) $(2p)^6$ (3p), $(2p)^5$ (3d)



Mo XXXIII グロトリアン・ダイアグラム

Mo XXXIII　エネルギーレベル

EVEN 1 $(2s)^2\ (2p)^6$

ODD 1 $(2s)^2\ (2p)^5\ (3s)$

2 $(2s)\ (2p)^6\ (3p)$

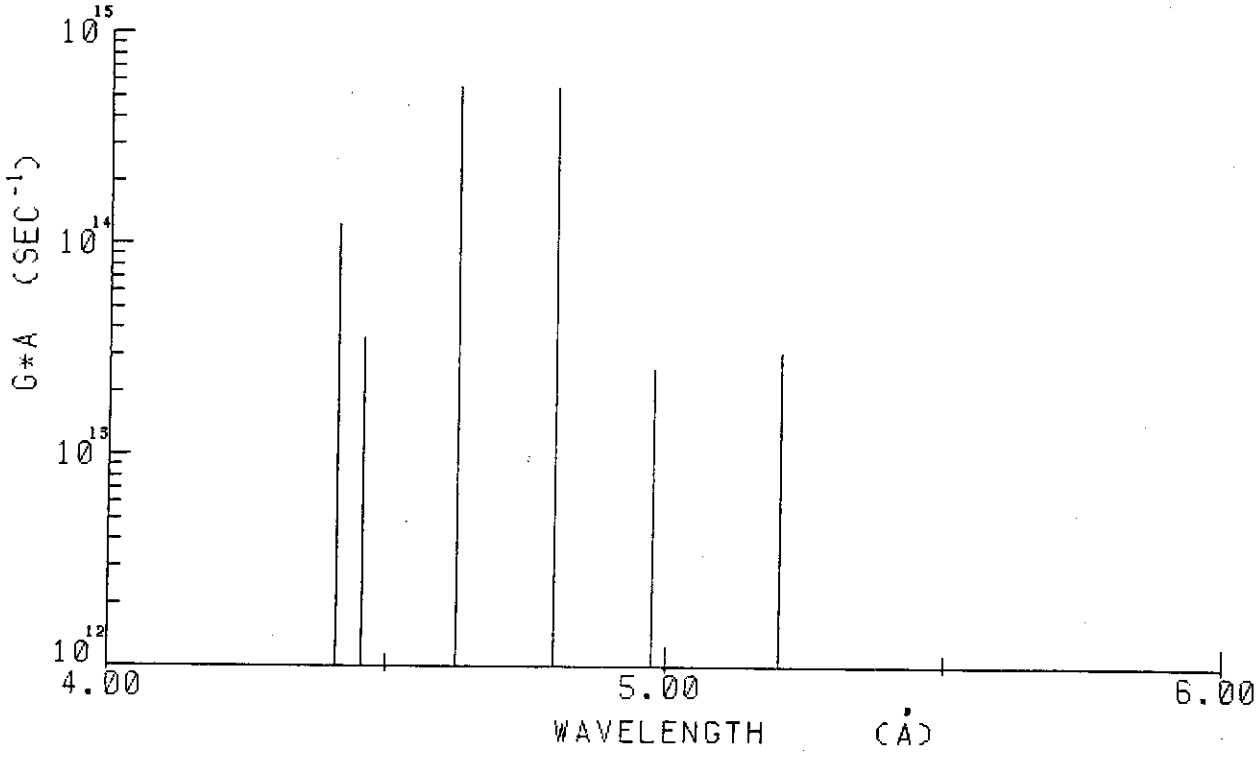
3 $(2s)^2\ (2p)^5\ (3d)$

EVEN PARITY

J	NO	ENERGY(KK)		LEADING PERCENTAGES	
0.0	1	0.004	---	1 1S100.0%	

ODD PARITY

J	NO	ENERGY(KK)		LEADING PERCENTAGES	
0.0	1	20074.875	---	1(0.5,0.5) 99.8%	
0.0	2	20566.375	---	3(1.5,1.5) 99.7%	
0.0	3	22420.875	---	2(0.5,0.5) 99.7%	
1.0	1	19216.699	---	1(1.5,0.5) 99.8%	
1.0	2	20090.168	---	1(0.5,0.5) 99.6%	
1.0	3	20594.172	---	3(1.5,1.5) 86.8%	3(1.5,2.5) 12.9%
1.0	4	20823.945	---	3(1.5,2.5) 84.9%	3(1.5,1.5) 13.1%
1.0	5	21616.105	---	3(0.5,1.5) 97.7%	
1.0	6	22432.137	---	2(0.5,0.5) 99.0%	
1.0	7	22671.613	---	2(0.5,1.5) 99.3%	
2.0	1	19187.160	---	1(1.5,0.5) 99.9%	
2.0	2	20637.480	---	3(1.5,1.5) 86.9%	3(1.5,2.5) 12.8%
2.0	3	20677.383	---	3(1.5,2.5) 86.8%	3(1.5,1.5) 12.9%
2.0	4	21506.512	---	3(0.5,1.5) 99.9%	
2.0	5	21560.039	---	3(0.5,2.5) 99.5%	
2.0	6	22648.051	---	2(0.5,1.5) 99.6%	
3.0	1	20624.770	---	3(1.5,1.5) 99.9%	
3.0	2	20712.207	---	3(1.5,2.5) 99.9%	
3.0	3	21576.699	---	3(0.5,2.5) 99.9%	
4.0	1	20657.391	---	3(1.5,2.5)100.0%	



Mo XXXIII　スペクトル・パターン

$(2s)^2\ (2p)^6 - (2s)^2\ (2p)^5\ (3s)$

$(2s)^2\ (2p)^5\ (3d)$

$(2s)\ (2p)^6\ (3p)$

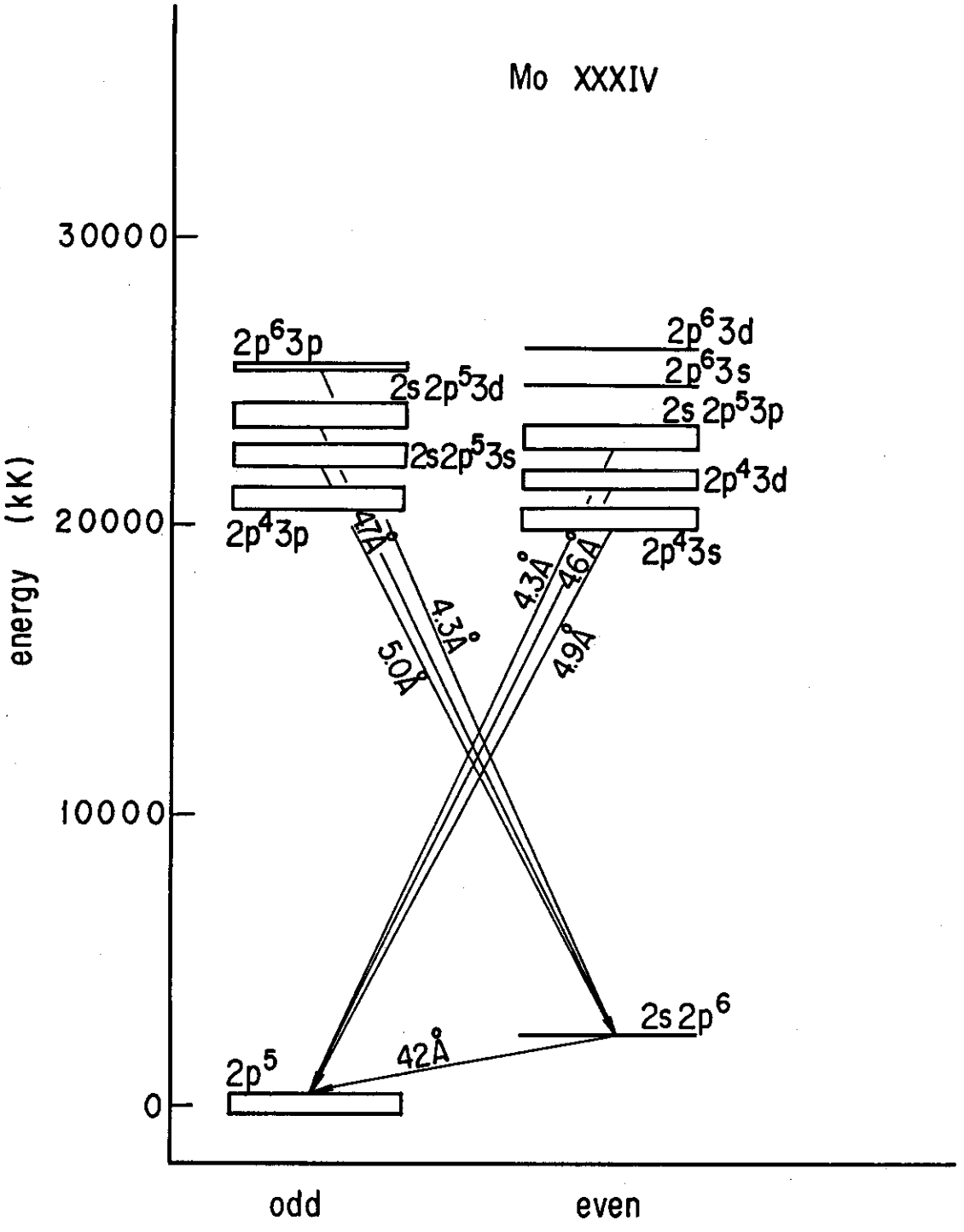
Mo XXXIII　波長，振動子強度

$(2s)^2\ (2p)^6 - (2s)^2\ (2p)^5\ (3s)$

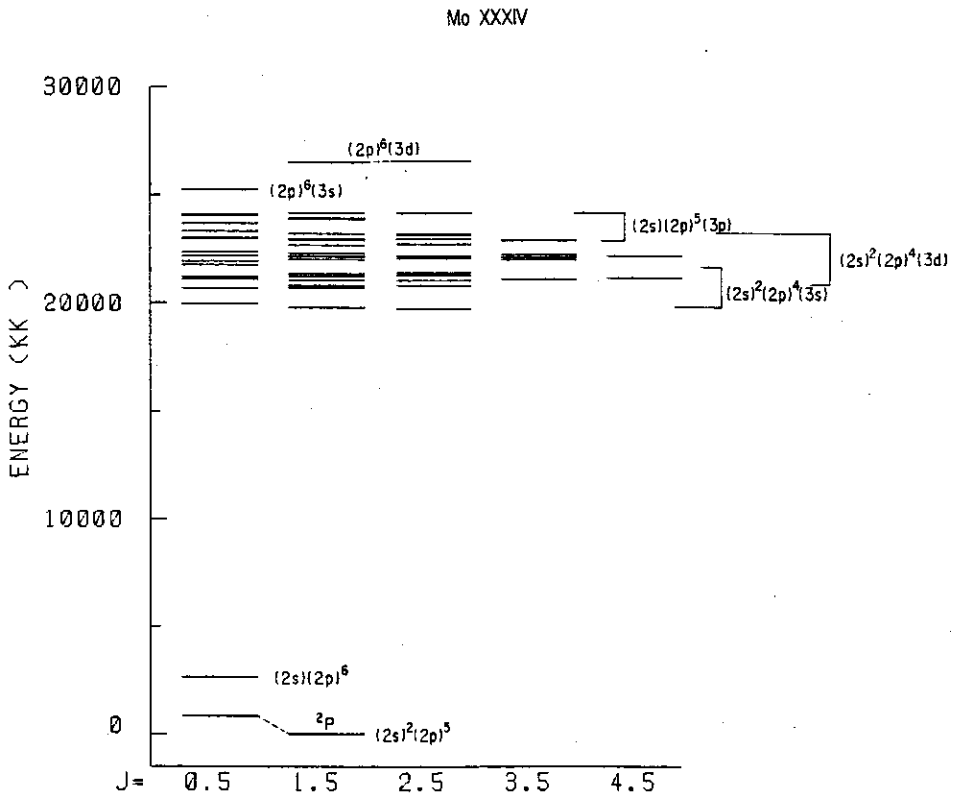
$(2s)^2\ (2p)^5\ (3d)$

$(2s)\ (2p)^6\ (3p)$

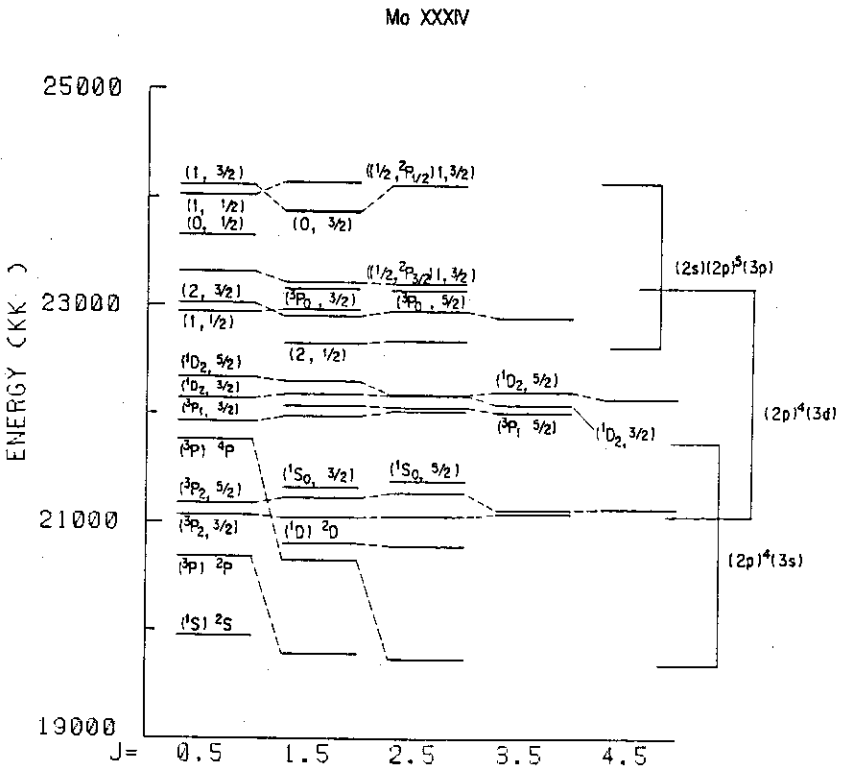
	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
1	0.004	0.0	19216.687	1.0	5.204	0.1252	0.3083E+14
2	0.004	0.0	20090.156	1.0	4.978	0.0956	0.2573E+14
3	0.004	0.0	20823.934	1.0	4.802	1.9421	0.5617E+15
4	0.004	0.0	21616.094	1.0	4.626	1.8106	0.5643E+15
5	0.004	0.0	22432.125	1.0	4.458	0.1067	0.3580E+14
6	0.004	0.0	22671.598	1.0	4.411	0.3580	0.1227E+15



Mo XXXIV　グロトリアン・ダイアグラム



Mo XXXIV エネルギーレベル



Mo XXXIV エネルギーレベル
$(2s)^2(2p)^4(3s)$, $(2s)^2(2p)^4(3d)$,
$(2s)(2p)^5(3p)$

Mo XXXIV エネルギーレベル

ODD 1 $(2s)^2\ (2p)^5$

EVEN 1 $(2s)\ (2p)^6$

2 $(2s)^2\ (2p)^4\ (3d)$

3 $(2s)^2\ (2p)^4\ (3s)$

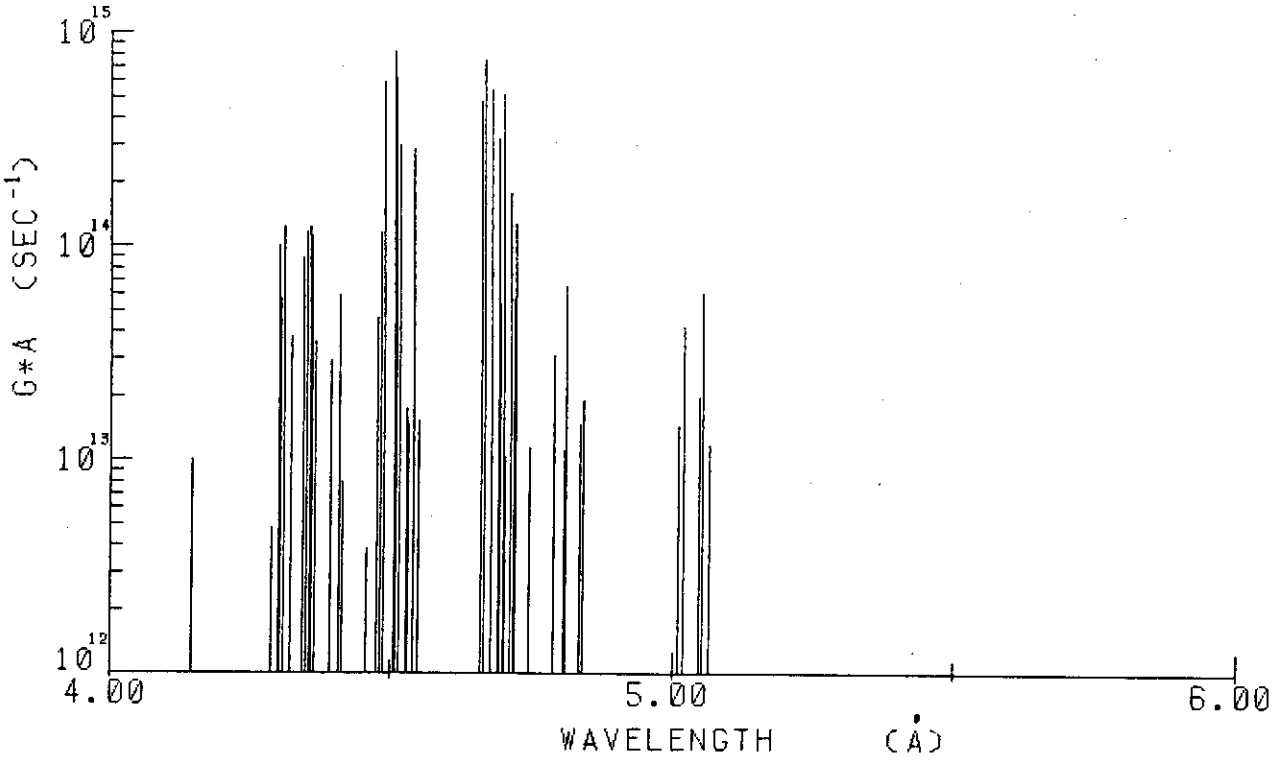
4 $(2s)\ (2p)^5\ (3p)$

ODD PARITY J	NO	ENERGY(KK)		LEADING PERCENTAGES	
0.5	1	884.356	---	1 2P100.0%	
1.5	1	0.922	---	1 2P100.0%	

EVEN PARITY J	NO	ENERGY(KK)		LEADING PERCENTAGES	
0.5	1	2663.590	---	1 2S100.0%	
0.5	2	19955.402	---	3 (1S) 2S 55.9%	3 (3P) 4P 31.0%
0.5	3	20689.488	---	3 (3P) 2P 66.4%	3 (3P) 4P 32.9%
0.5	4	21067.422	---	2 (3P) 4P 36.4%	2 (1D) 2P 25.1%
0.5	5	21182.586	---	2 (3P) 2P 36.4%	2 (3P) 4P 32.4%
0.5	6	21765.734	---	3 (1S) 2S 42.0%	3 (3P) 4P 35.5%
0.5	7	21929.238	---	2 (3P) 4D 78.3%	2 (3P) 2P 10.8%
0.5	8	22152.965	---	2 (1D) 2S 57.9%	2 (3P) 4P 26.2%
0.5	9	22344.090	---	2 (1D) 2P 48.4%	2 (3P) 2P 35.5%
0.5	10	22944.883	---	4 (3P) 4P 33.7%	4 (1P) 2P 21.9%
0.5	11	23024.160	---	4 (3P) 2P 46.2%	4 (3P) 2S 32.8%
0.5	12	23319.695	---	4 (3P) 4P 34.1%	4 (1P) 2P 19.0%
0.5	13	23646.285	---	4 (3P) 4D 54.7%	4 (3P) 2P 26.7%
0.5	14	24022.406	---	4 (1P) 2P 35.7%	4 (3P) 2S 28.9%
0.5	15	24118.707	---	4 (1P) 2S 44.5%	4 (3P) 2P 19.1%
1.5	1	19786.437	---	3 (3P) 2P 58.6%	3 (1D) 2D 27.2%
1.5	2	20649.449	---	3 (3P) 4P 84.1%	3 (3P) 2P 14.4%
1.5	3	20801.113	---	3 (1D) 2D 71.3%	3 (3P) 2P 26.6%
1.5	4	21046.559	---	2 (3P) 4D 37.7%	2 (3P) 4P 22.1%
1.5	5	21221.816	---	2 (3P) 4P 28.2%	2 (3P) 2D 25.4%
1.5	6	21318.781	---	2 (1S) 2D 32.9%	2 (3P) 2P 24.3%
1.5	7	21977.496	---	2 (3P) 4D 38.2%	2 (3P) 4F 24.7%
1.5	8	22083.461	---	2 (3P) 2P 35.9%	2 (1D) 2P 15.8%
1.5	9	22182.715	---	2 (1D) 2P 50.3%	2 (3P) 4P 16.6%
1.5	10	22309.148	---	2 (1D) 2D 49.5%	2 (3P) 2D 33.8%
1.5	11	22649.793	---	4 (3P) 4S 41.0%	4 (3P) 4P 40.9%
1.5	12	22907.512	---	4 (3P) 4D 27.0%	4 (3P) 4S 26.5%
1.5	13	22970.781	---	4 (3P) 2P 56.0%	4 (1P) 2D 24.1%
1.5	14	23162.301	---	2 (1S) 2D 40.4%	2 (3P) 4F 21.8%
1.5	15	23212.598	---	4 (3P) 2D 30.0%	4 (1P) 2P 28.2%
1.5	16	23864.133	---	4 (3P) 4D 46.1%	4 (1P) 2D 29.4%
1.5	17	23880.875	---	4 (3P) 2D 28.5%	4 (1P) 2D 20.5%
1.5	18	24140.121	---	4 (1P) 2P 52.4%	4 (3P) 2D 19.7%
2.5	1	19739.293	---	3 (3P) 4P 74.9%	3 (1D) 2D 24.9%
2.5	2	20782.113	---	3 (1D) 2D 74.5%	3 (3P) 4P 24.7%
2.5	3	21053.418	---	2 (3P) 4D 48.9%	2 (1D) 2D 11.7%
2.5	4	21271.594	---	2 (3P) 2D 27.1%	2 (3P) 4P 22.6%
2.5	5	21378.172	---	2 (1S) 2D 49.3%	2 (3P) 4F 19.0%
2.5	6	22025.625	---	2 (3P) 4F 54.1%	2 (3P) 2D 22.9%
2.5	7	22068.816	---	2 (3P) 2F 50.3%	2 (3P) 4P 36.4%
2.5	8	22175.457	---	2 (1D) 2D 68.0%	2 (3P) 4P 10.6%
2.5	9	22191.293	---	2 (1D) 2F 56.9%	2 (3P) 2D 27.0%
2.5	10	22680.523	---	4 (3P) 4D 43.1%	4 (3P) 2D 38.6%

EVEN PARITY

J	NO	ENERGY(KK)		LEADING PERCENTAGES	
2.5	11	22948.500	---	4 (3P) 4P 54.7%	4 (3P) 2D 42.5%
2.5	12	23145.027	---	2 (1S) 2D 38.7%	2 (3P) 2F 14.4%
2.5	13	23203.160	---	4 (1P) 2D 35.4%	4 (3P) 4D 28.1%
2.5	14	24120.828	---	4 (1P) 2D 61.1%	4 (3P) 4D 21.6%
3.5	1	21077.996	---	2 (3P) 4F 36.6%	2 (3P) 4D 27.4%
3.5	2	21119.180	---	2 (3P) 2F 46.8%	2 (3P) 4D 26.9%
3.5	3	22018.250	---	2 (3P) 4F 47.1%	2 (3P) 4D 36.0%
3.5	4	22095.805	---	2 (1D) 2G 65.6%	2 (3P) 2F 15.8%
3.5	5	22209.223	---	2 (1D) 2F 67.8%	2 (3P) 2F 12.1%
3.5	6	22893.816	---	4 (3P) 4D 99.3%	
4.5	1	21126.391	---	2 (3P) 4F 73.4%	2 (1D) 2G 26.6%
4.5	2	22150.973	---	2 (1D) 2G 73.4%	2 (3P) 4F 26.6%



Mo XXXIV スペクトル・パターン

$(2s)^2\ (2p)^5 - (2s)^2\ (2p)^4\ (3s)$

$(2s)^2\ (2p)^4\ (3d)$

$(2s)\ (2p)^5\ (3p)$

Mo XXXIV　波長，振動子強度

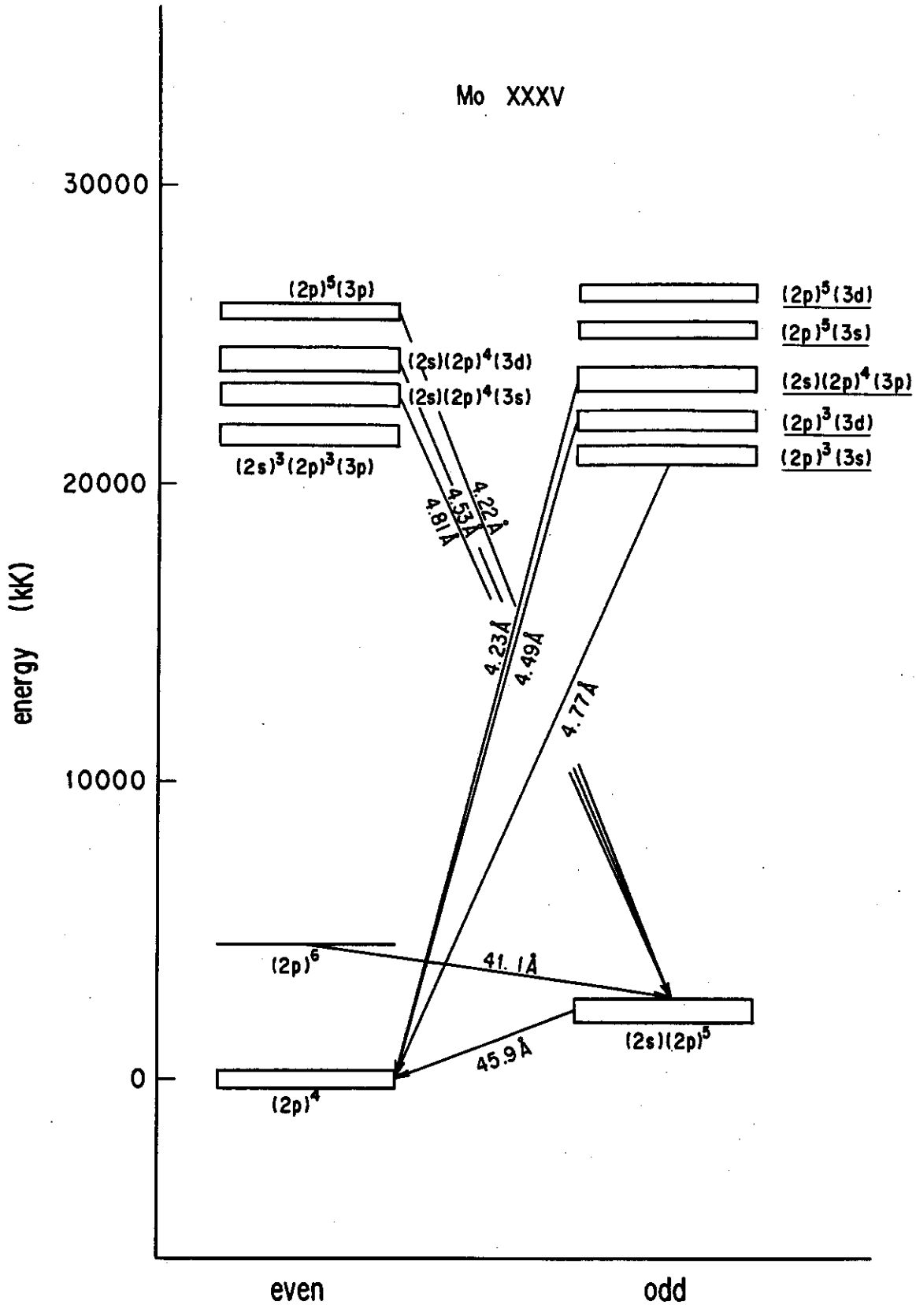
$(2s)^2\ (2p)^5 - (2s)\ (2p)^6$

$(2s)^2\ (2p)^4\ (3s)$

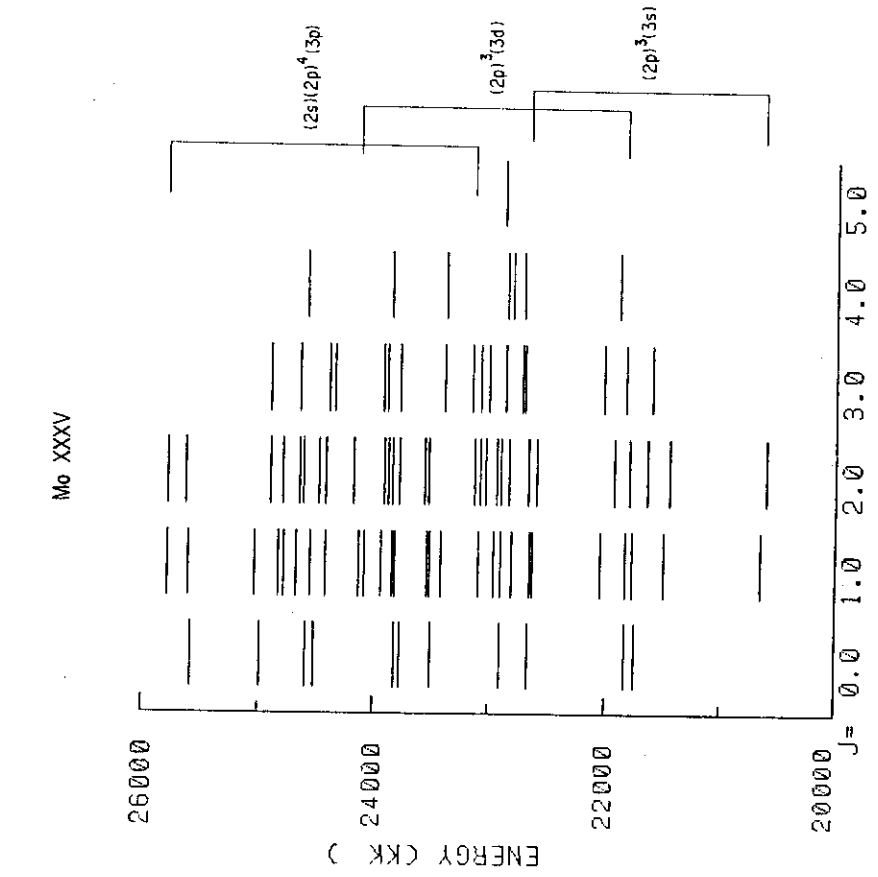
$(2s)^2\ (2p)^4\ (3d)$

$(2s)\ (2p)^5\ (3p)$

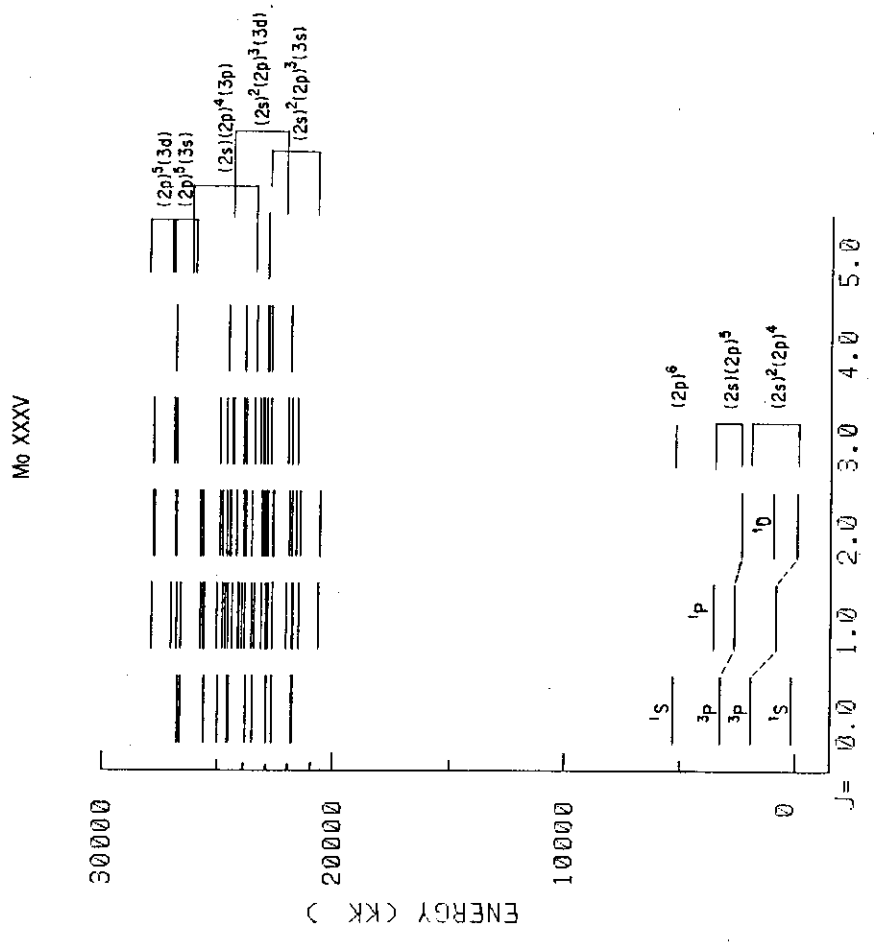
NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
1	884.356	0.5	2663.589	0.5	56.204	0.0637	0.1346E+12
2	0.922	1.5	2663.589	0.5	37.556	0.1907	0.9017E+12
3	0.922	1.5	19739.277	2.5	5.066	0.0459	0.1193E+14
4	0.922	1.5	19786.430	1.5	5.054	0.2359	0.6160E+14
5	884.356	0.5	20689.484	0.5	5.049	0.0766	0.2004E+14
6	884.356	0.5	20801.102	1.5	5.021	0.1591	0.4209E+14
7	0.922	1.5	19955.391	0.5	5.011	0.0545	0.1447E+14
8	0.922	1.5	20649.437	1.5	4.843	0.0681	0.1937E+14
9	0.922	1.5	20689.484	0.5	4.834	0.0524	0.1496E+14
10	0.922	1.5	20782.109	2.5	4.812	0.2277	0.6560E+14
11	0.922	1.5	20801.102	1.5	4.808	0.0387	0.1117E+14
12	884.356	0.5	21765.727	0.5	4.789	0.1064	0.3095E+14
13	0.922	1.5	21067.406	0.5	4.747	0.0388	0.1149E+14
14	0.922	1.5	21182.574	0.5	4.721	0.4313	0.1291E+15
15	884.356	0.5	22083.453	1.5	4.717	0.1897	0.5687E+14
16	0.922	1.5	21221.805	1.5	4.712	0.5978	0.1796E+15
17	884.356	0.5	22152.957	0.5	4.702	0.0347	0.1045E+14
18	0.922	1.5	21271.582	2.5	4.701	1.7149	0.5175E+15
19	884.356	0.5	22182.703	1.5	4.695	0.1786	0.5405E+14
20	0.922	1.5	21318.766	1.5	4.691	1.0606	0.3215E+15
21	0.922	1.5	21378.156	2.5	4.678	1.7982	0.5481E+15
22	884.356	0.5	22309.133	1.5	4.667	2.4378	0.7463E+15
23	884.356	0.5	22344.078	0.5	4.660	1.5586	0.4787E+15
24	0.922	1.5	21977.484	1.5	4.550	0.0477	0.1535E+14
25	0.922	1.5	22025.613	2.5	4.540	0.8858	0.2866E+15
26	0.922	1.5	22068.812	2.5	4.531	0.0455	0.1477E+14
27	884.356	0.5	22970.766	1.5	4.528	0.0543	0.1768E+14
28	0.922	1.5	22083.453	1.5	4.528	0.0126	0.4088E+13
29	0.922	1.5	22152.957	0.5	4.514	0.9139	0.2991E+15
30	0.922	1.5	22175.453	2.5	4.510	0.2891	0.9480E+14
31	0.922	1.5	22182.703	1.5	4.508	1.8663	0.6125E+15
32	0.922	1.5	22191.277	2.5	4.506	2.4930	0.8188E+15
33	884.356	0.5	23162.285	1.5	4.489	1.7889	0.5922E+15
34	0.922	1.5	22309.133	1.5	4.483	0.3552	0.1179E+15
35	0.922	1.5	22344.078	0.5	4.476	0.1390	0.4627E+14
36	884.356	0.5	23319.680	0.5	4.457	0.0115	0.3864E+13
37	0.922	1.5	22649.789	1.5	4.415	0.0230	0.7876E+13
38	0.922	1.5	22680.512	2.5	4.409	0.1730	0.5935E+14
39	884.356	0.5	23646.270	0.5	4.393	0.0842	0.2911E+14
40	0.922	1.5	22907.504	1.5	4.366	0.1023	0.3579E+14
41	0.922	1.5	22948.492	2.5	4.358	0.3214	0.1129E+15
42	0.922	1.5	22944.879	0.5	4.358	0.0656	0.2305E+14
43	0.922	1.5	22970.766	1.5	4.354	0.3520	0.1239E+15
44	884.356	0.5	23880.863	1.5	4.348	0.3298	0.1163E+15
45	0.922	1.5	23024.156	0.5	4.343	0.2514	0.8887E+14
46	884.356	0.5	24022.398	0.5	4.322	0.1073	0.3830E+14
47	0.922	1.5	23145.023	2.5	4.321	0.0193	0.6895E+13
48	0.922	1.5	23203.148	2.5	4.310	0.3431	0.1232E+15
49	0.922	1.5	23212.590	1.5	4.308	0.1330	0.4778E+14
50	884.356	0.5	24118.703	0.5	4.304	0.1589	0.5720E+14
51	884.356	0.5	24140.109	1.5	4.300	0.2816	0.1016E+15
52	0.922	1.5	23319.680	0.5	4.288	0.0132	0.4790E+13
53	0.922	1.5	24120.812	2.5	4.146	0.0262	0.1017E+14



Mo XXXV　グロトリアン・ダイアグラム



Mo XXXV エネルギーレベル
$(2p)^3(3s)$, $(2p)^3(3d)$,
$(2s)(2p)^4(3p)$



Mo XXXV エネルギーレベル

Mo XXXV エネルギーレベル

EVEN 1 $(2s)^2$ $(2p)^2$

2 $(2p)^4$

ODD 1 $(2s)$ $(2p)^5$

EVEN PARITY

J	NO	ENERGY(KK)		LEADING PERCENTAGES			
0.0	1	196.610	---	1	1S 55.6%	1	3P 43.9%
0.0	2	1925.172	---	1	3P 56.0%	1	1S 43.1%
0.0	3	5314.207	---	2	1S 98.7%	1	1S 1.2%
1.0	1	862.928	---	1	3P100.0%		
2.0	1	-0.002	---	1	3P 74.5%	1	1D 25.5%
2.0	2	989.685	---	1	1D 74.5%	1	3P 25.5%

ODD PARITY

J	NO	ENERGY(KK)		LEADING PERCENTAGES			
0.0	1	3299.726	---	1	3P100.0%		
1.0	1	2667.843	---	1	3P 63.0%	1	1P 37.0%
1.0	2	3556.778	---	1	1P 63.0%	1	3P 37.0%
2.0	1	2389.532	---	1	3P100.0%		

Mo XXXV エネルギーレベル　　n＝3

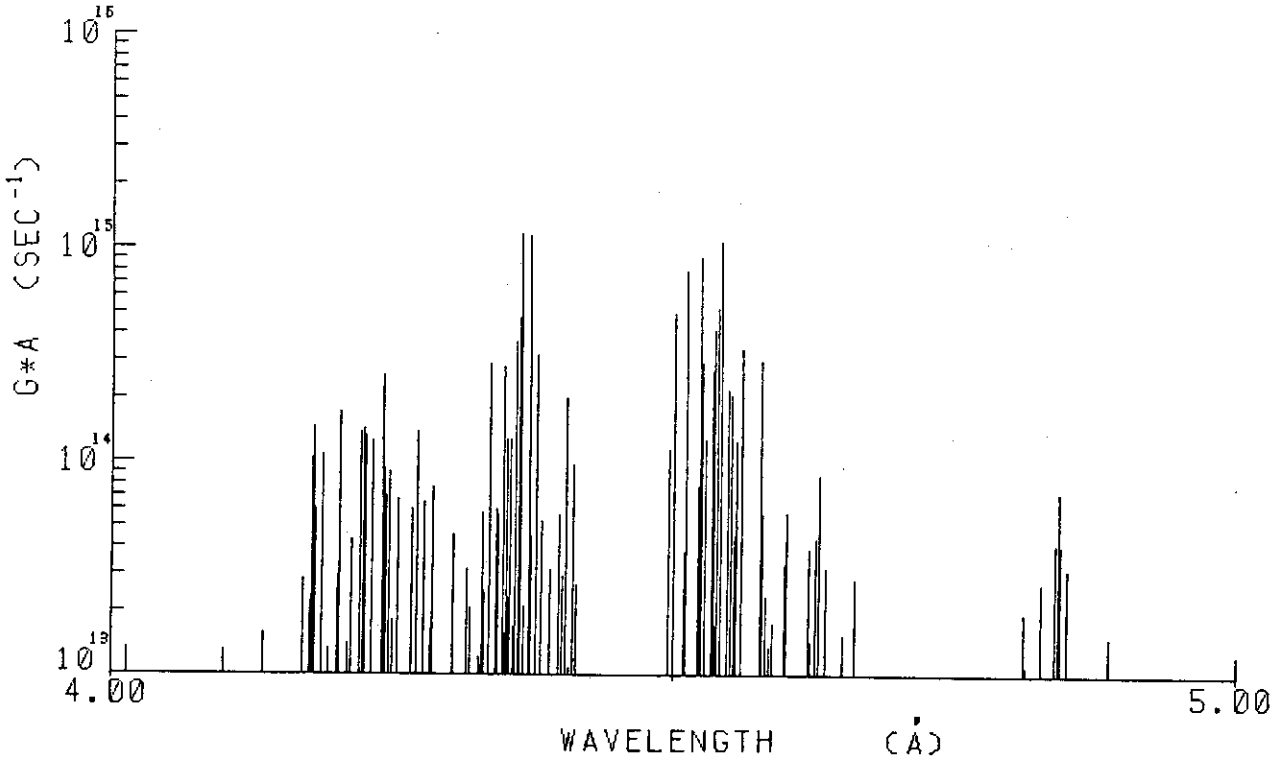
ODD 1 $(2s)^2\ (2p)^3\ (3s)$

2 $(2s)^2\ (2p)^3\ (3d)$

3 $(2s)\ (2p)^4\ (3p)$

ODD J	PARITY NO	ENERGY(KK)		LEADING PERCENTAGES	
0.0	1	21751.105	---	1 (2P) 3P 97.9%	
0.0	2	21833.410	---	2 (2P) 3P 40.5%	2 (4S) 5D 38.2%
0.0	3	22666.937	---	2 (4S) 5D 45.9%	2 (2D) 1S 35.3%
0.0	4	22909.969	---	2 (2D) 3P 53.2%	2 (2D) 1S 43.9%
0.0	5	23506.355	---	3 (1S) 3P 47.9%	3 (3P) 5D 37.6%
0.0	6	23772.766	---	3 (1D) 3P 38.5%	3 (3P) 3P 23.4%
0.0	7	23818.750	---	2 (2P) 3P 53.8%	2 (2D) 3P 19.5%
0.0	8	24519.262	---	3 (3P) 3P 39.6%	3 (3P) 5D 23.3%
0.0	9	24586.281	---	3 (3P) 3P 48.8%	3 (3P) 1S 15.3%
0.0	10	24981.117	---	3 (1D) 3P 47.3%	3 (3P) 1S 39.6%
0.0	11	25585.410	---	3 (1S) 3P 36.7%	3 (3P) 3P 27.1%
1.0	1	20655.609	---	1 (4S) 3S 31.8%	1 (2P) 1P 27.3%
1.0	2	21498.098	---	1 (4S) 3S 52.0%	1 (2D) 3D 46.5%
1.0	3	21768.355	---	1 (2P) 3P 65.9%	1 (2P) 1P 32.1%
1.0	4	21835.621	---	2 (4S) 5D 37.1%	2 (2P) 3P 26.1%
1.0	5	22041.492	---	2 (4S) 3D 33.3%	2 (2P) 1P 21.7%
1.0	6	22632.379	---	1 (2P) 1P 34.1%	1 (2D) 3D 24.8%
1.0	7	22656.090	---	2 (2D) 3D 34.5%	2 (4S) 5D 33.3%
1.0	8	22810.730	---	2 (4S) 3D 27.3%	2 (2D) 1P 21.2%
1.0	9	22909.223	---	2 (2D) 3P 58.8%	2 (2D) 1P 13.6%
1.0	10	22971.273	---	2 (2D) 3S 57.1%	2 (2D) 1P 24.3%
1.0	11	23103.434	---	2 (2P) 3D 42.8%	2 (2P) 1P 28.8%
1.0	12	23429.871	---	3 (3P) 3P 27.9%	3 (3P) 5P 24.0%
1.0	13	23526.117	---	3 (3P) 5D 35.1%	3 (1S) 3P 15.3%
1.0	14	23543.223	---	3 (3P) 3S 36.5%	3 (1S) 3P 15.1%
1.0	15	23822.727	---	3 (3P) 3D 33.3%	3 (1S) 1P 32.8%
1.0	16	23850.383	---	2 (2P) 3P 41.4%	2 (4S) 5D 12.2%
1.0	17	23942.363	---	3 (1D) 3D 20.6%	3 (3P) 3P 19.3%
1.0	18	24088.301	---	2 (2P) 1P 39.1%	2 (4S) 3D 16.9%
1.0	19	24129.937	---	3 (3P) 5P 23.5%	3 (3P) 5D 19.1%
1.0	20	24419.434	---	3 (1D) 3P 22.1%	3 (1D) 3D 16.8%
1.0	21	24549.898	---	3 (3P) 3D 39.0%	3 (3P) 3P 10.7%
1.0	22	24675.809	---	3 (1D) 1P 45.6%	3 (1D) 3D 14.8%
1.0	23	24781.125	---	3 (3P) 3P 23.3%	3 (3P) 1P 14.8%
1.0	24	24835.570	---	3 (3P) 3S 32.6%	3 (3P) 3D 17.1%
1.0	25	25039.852	---	3 (3P) 1P 32.4%	3 (1D) 3P 22.1%
1.0	26	25610.910	---	3 (3P) 3D 25.9%	3 (1S) 3P 19.4%
1.0	28	25795.516	---	3 (1S) 1P 21.7%	3 (3P) 3P 19.4%
2.0	1	20608.547	---	1 (2P) 3P 41.3%	1 (4S) 5S 36.6%
2.0	2	21450.437	---	1 (4S) 5S 48.6%	1 (2D) 3D 35.4%
2.0	3	21634.668	---	1 (2D) 1D 65.5%	1 (2D) 3D 33.1%
2.0	4	21797.426	---	2 (4S) 5D 19.6%	2 (2D) 3F 18.6%
2.0	5	21929.684	---	2 (2P) 3P 21.0%	2 (4S) 5D 19.4%
2.0	6	22602.996	---	1 (2P) 3P 53.7%	1 (2D) 3D 17.1%
2.0	7	22666.059	---	2 (2D) 3F 37.1%	2 (4S) 5D 35.3%
2.0	8	22834.039	---	2 (2D) 3P 31.5%	2 (2D) 1D 15.4%
2.0	9	22913.656	---	2 (2D) 3D 59.2%	2 (4S) 3D 22.7%
2.0	10	22948.586	---	2 (2P) 3F 37.4%	2 (2D) 3P 22.5%
2.0	11	23037.312	---	2 (2P) 3F 29.7%	2 (2D) 1D 27.8%

ODD J	PARITY NO	ENERGY(KK)		LEADING PERCENTAGES	
2.0	12	23086.395	---	2 (2P) 3P 31.4%	2 (2P) 3D 25.7%
2.0	13	23136.379	---	3 (3P) 5P 39.9%	3 (3P) 5S 19.4%
2.0	14	23529.078	---	3 (3P) 3D 23.2%	3 (1D) 3F 21.5%
2.0	15	23567.836	---	3 (3P) 3P 42.2%	3 (1D) 1D 18.8%
2.0	16	23788.570	---	3 (1S) 3P 36.6%	3 (3P) 5P 20.8%
2.0	17	23842.090	---	3 (3P) 5D 16.6%	3 (1D) 3D 14.7%
2.0	18	23885.812	---	2 (2P) 3P 25.4%	2 (2P) 1D 13.1%
2.0	19	23922.441	---	2 (2P) 3D 22.2%	2 (2P) 1D 20.0%
2.0	20	24187.215	---	3 (1D) 3F 22.8%	3 (3P) 5D 21.7%
2.0	21	24427.531	---	3 (1D) 3D 25.0%	3 (3P) 3D 24.5%
2.0	22	24483.219	---	3 (1D) 3P 54.3%	3 (3P) 5S 14.6%
2.0	23	24612.203	---	3 (1D) 1D 19.5%	3 (1D) 3P 16.7%
2.0	24	24654.773	---	3 (1D) 1D 31.5%	3 (3P) 1D 19.4%
2.0	25	24791.234	---	3 (3P) 3D 26.6%	3 (1S) 3P 14.2%
2.0	26	24902.191	---	3 (3P) 3P 29.9%	3 (3P) 1D 25.6%
2.0	27	25632.562	---	2 (2P) 3P 93.4%	3 (1S) 3P 1.6%
2.0	28	25785.359	---	3 (1S) 3P 35.4%	3 (3P) 3D 21.3%
3.0	1	21599.746	---	1 (2D) 3D 98.9%	
3.0	2	21824.332	---	2 (4S) 5D 27.1%	2 (2P) 3F 23.4%
3.0	3	22017.957	---	2 (2P) 1F 21.8%	2 (4S) 3D 19.0%
3.0	4	22702.109	---	2 (4S) 5D 39.4%	2 (2D) 3F 33.5%
3.0	5	22731.672	---	2 (4S) 3D 41.4%	2 (2D) 3D 25.1%
3.0	6	22869.492	---	2 (2D) 3D 40.9%	2 (2D) 3F 32.0%
3.0	7	23014.148	---	2 (2D) 1F 52.6%	2 (2D) 3D 20.3%
3.0	8	23094.707	---	2 (2P) 3F 43.5%	2 (2P) 1F 21.9%
3.0	9	23162.742	---	3 (3P) 5D 30.3%	3 (3P) 3D 28.3%
3.0	10	23401.719	---	3 (3P) 3D 40.7%	3 (3P) 5P 40.1%
3.0	11	23787.402	---	3 (3P) 3D 25.9%	3 (3P) 5D 24.8%
3.0	12	23896.437	---	2 (2P) 1F 30.3%	2 (2P) 3F 21.6%
3.0	13	23933.340	---	2 (2P) 3D 38.6%	2 (2D) 3F 13.3%
3.0	14	24355.305	---	3 (1D) 3F 48.1%	3 (1D) 1F 16.6%
3.0	15	24392.426	---	3 (3P) 5D 24.9%	3 (1D) 1F 19.7%
3.0	16	24648.605	---	3 (1D) 3D 57.3%	3 (1D) 1F 23.9%
3.0	17	24905.406	---	3 (3P) 3D 60.5%	3 (1D) 3F 18.9%
4.0	1	21884.758	---	2 (2P) 3F 41.3%	2 (4S) 5D 37.1%
4.0	2	22722.445	---	2 (4S) 5D 47.8%	2 (2D) 3G 29.0%
4.0	3	22814.613	---	2 (2D) 3G 41.2%	2 (2D) 1G 29.9%
4.0	4	22867.004	---	2 (2D) 3F 63.5%	2 (2D) 1G 32.8%
4.0	5	23395.621	---	3 (3P) 5D 81.5%	3 (1D) 3F 17.6%
4.0	6	23861.250	---	2 (2P) 3F 54.7%	2 (2D) 3G 15.2%
4.0	7	24594.648	---	3 (1D) 3F 81.5%	3 (3P) 5D 17.8%
5.0	1	22880.035	---	2 (2D) 3G100.0%	



Mo XXXV スペクトル・パターン

$(2s)^2\ (2p)^4 - (2s)^2\ (2p)^3\ (3s)$

$(2s)^2\ (2p)^3\ (3d)$

$(2s)\ (2p)^4\ (3p)$

Mo XXXV　波長，振動子強度

$(2s)^2\ (2p)^4 - (2s)\ (2p)^5$

$(2s)^2\ (2p)^3\ (3s)$

$(2s)^2\ (2p)^3\ (3d)$

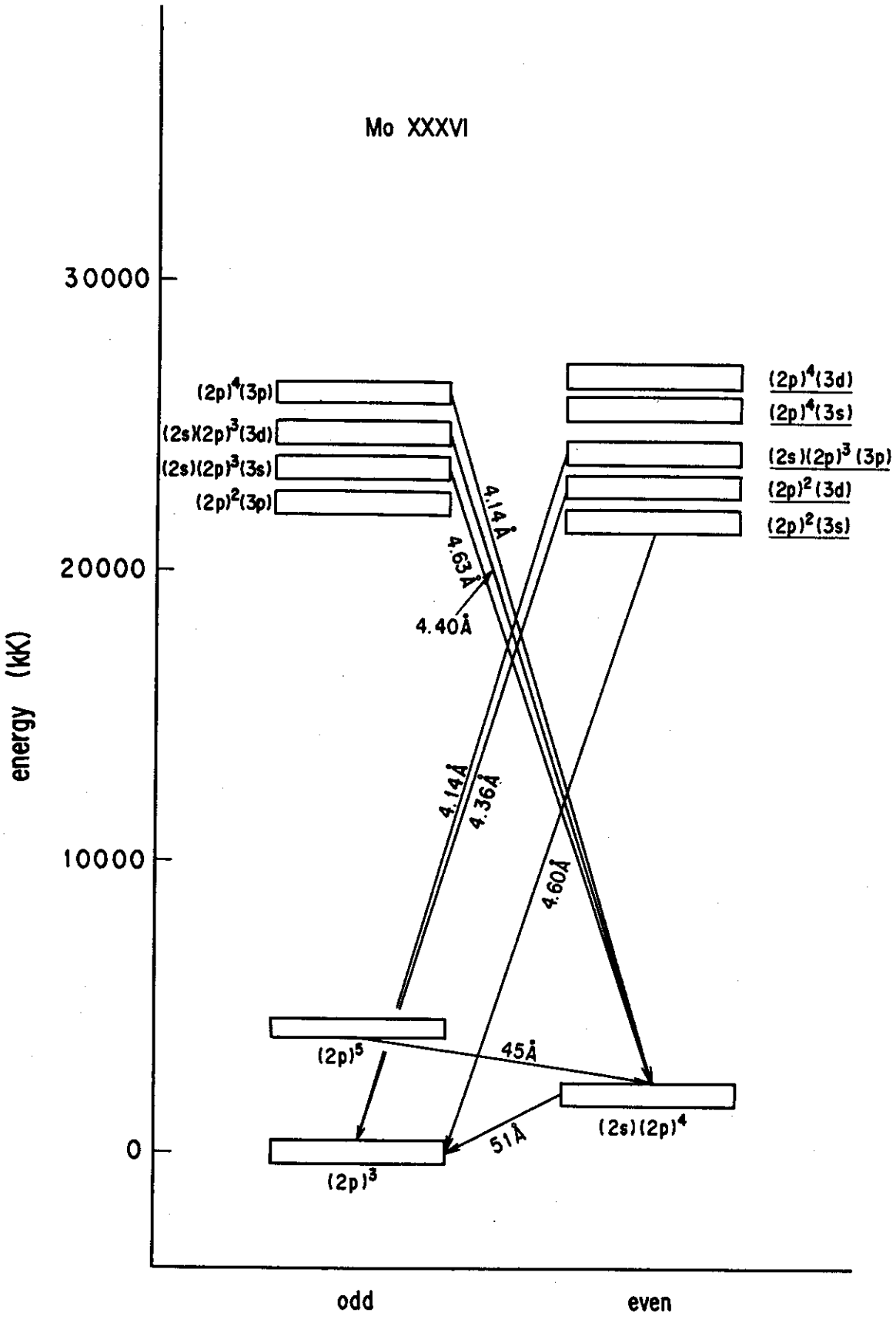
$(2s)\ (2p)^4\ (3p)$

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
1	1925.171	0.0	2667.842	1.0	134.649	0.0023	0.8306E+09
2	989.685	2.0	2389.532	2.0	71.436	0.0479	0.6265E+11
3	862.927	1.0	2389.532	2.0	65.505	0.0683	0.1061E+12
4	1925.171	0.0	3556.778	1.0	61.289	0.0422	0.7498E+11
5	989.685	2.0	2667.842	1.0	59.589	0.0315	0.5917E+11
6	862.927	1.0	2667.842	1.0	55.404	0.0305	0.6633E+11
7	-0.002	2.0	2389.532	2.0	41.849	0.2387	0.9089E+12
8	862.927	1.0	3299.725	0.0	41.037	0.0872	0.3452E+12
9	196.610	0.0	2667.842	1.0	40.466	0.0728	0.2965E+12
10	989.685	2.0	3556.778	1.0	38.955	0.3230	0.1420E+13
11	-0.002	2.0	2667.842	1.0	37.483	0.2014	0.9562E+12
12	862.927	1.0	3556.778	1.0	37.122	0.0267	0.1292E+12
13	196.610	0.0	3556.778	1.0	29.760	0.0011	0.8215E+10
14	-0.002	2.0	3556.778	1.0	28.115	0.0123	0.1035E+12
15	196.610	0.0	20655.598	1.0	4.888	0.0538	0.1501E+14
16	989.685	2.0	21450.430	2.0	4.887	0.0136	0.3795E+13
17	989.685	2.0	21498.094	1.0	4.876	0.0248	0.6951E+13
18	862.927	1.0	21450.430	2.0	4.857	0.0299	0.8450E+13
19	989.685	2.0	21599.742	3.0	4.852	0.0523	0.1481E+14
20	-0.002	2.0	20608.543	2.0	4.852	0.1121	0.3176E+14
21	862.927	1.0	21498.094	1.0	4.846	0.1441	0.4093E+14
22	989.685	2.0	21634.652	2.0	4.844	0.2547	0.7242E+14
23	-0.002	2.0	20655.598	1.0	4.841	0.1466	0.4171E+14
24	1925.171	0.0	22632.367	1.0	4.829	0.0953	0.2725E+14
25	1925.171	0.0	22656.078	1.0	4.824	0.0239	0.6861E+13
26	862.927	1.0	21634.652	2.0	4.814	0.0387	0.1113E+14
27	989.685	2.0	21768.352	1.0	4.813	0.0676	0.1947E+14
28	862.927	1.0	21751.102	0.0	4.787	0.0289	0.8407E+13
29	862.927	1.0	21768.352	1.0	4.783	0.0133	0.3866E+13
30	-0.002	2.0	21450.430	2.0	4.662	0.0926	0.2843E+14
31	-0.002	2.0	21498.094	1.0	4.652	0.0502	0.1548E+14
32	196.610	0.0	21768.352	1.0	4.636	0.1044	0.3239E+14
33	-0.002	2.0	21599.742	3.0	4.630	0.2784	0.8662E+14
34	989.685	2.0	22602.988	2.0	4.627	0.1421	0.4428E+14
35	-0.002	2.0	21634.652	2.0	4.622	0.0459	0.1434E+14
36	989.685	2.0	22632.367	1.0	4.621	0.1254	0.3919E+14
37	196.610	0.0	21835.613	1.0	4.621	0.0532	0.1662E+14
38	989.685	2.0	22666.047	2.0	4.613	0.0136	0.4261E+13
39	989.685	2.0	22702.094	3.0	4.606	0.0105	0.3303E+13
40	862.927	1.0	22602.988	2.0	4.600	0.1828	0.5761E+14
41	989.685	2.0	22731.660	3.0	4.599	0.1066	0.3361E+14
42	862.927	1.0	22632.367	1.0	4.594	0.0132	0.4176E+13
43	862.927	1.0	22656.078	1.0	4.589	0.0103	0.3257E+13
44	-0.002	2.0	21797.422	2.0	4.588	0.0549	0.1741E+14
45	862.927	1.0	22666.926	0.0	4.586	0.0431	0.1365E+14
46	989.685	2.0	22810.719	1.0	4.583	0.0745	0.2366E+14
47	-0.002	2.0	21824.316	3.0	4.582	0.0162	0.5148E+13
48	-0.002	2.0	21835.613	1.0	4.580	0.1795	0.5707E+14
49	196.610	0.0	22041.484	1.0	4.578	0.9326	0.2968E+15
50	989.685	2.0	22834.031	2.0	4.578	0.0484	0.1539E+14

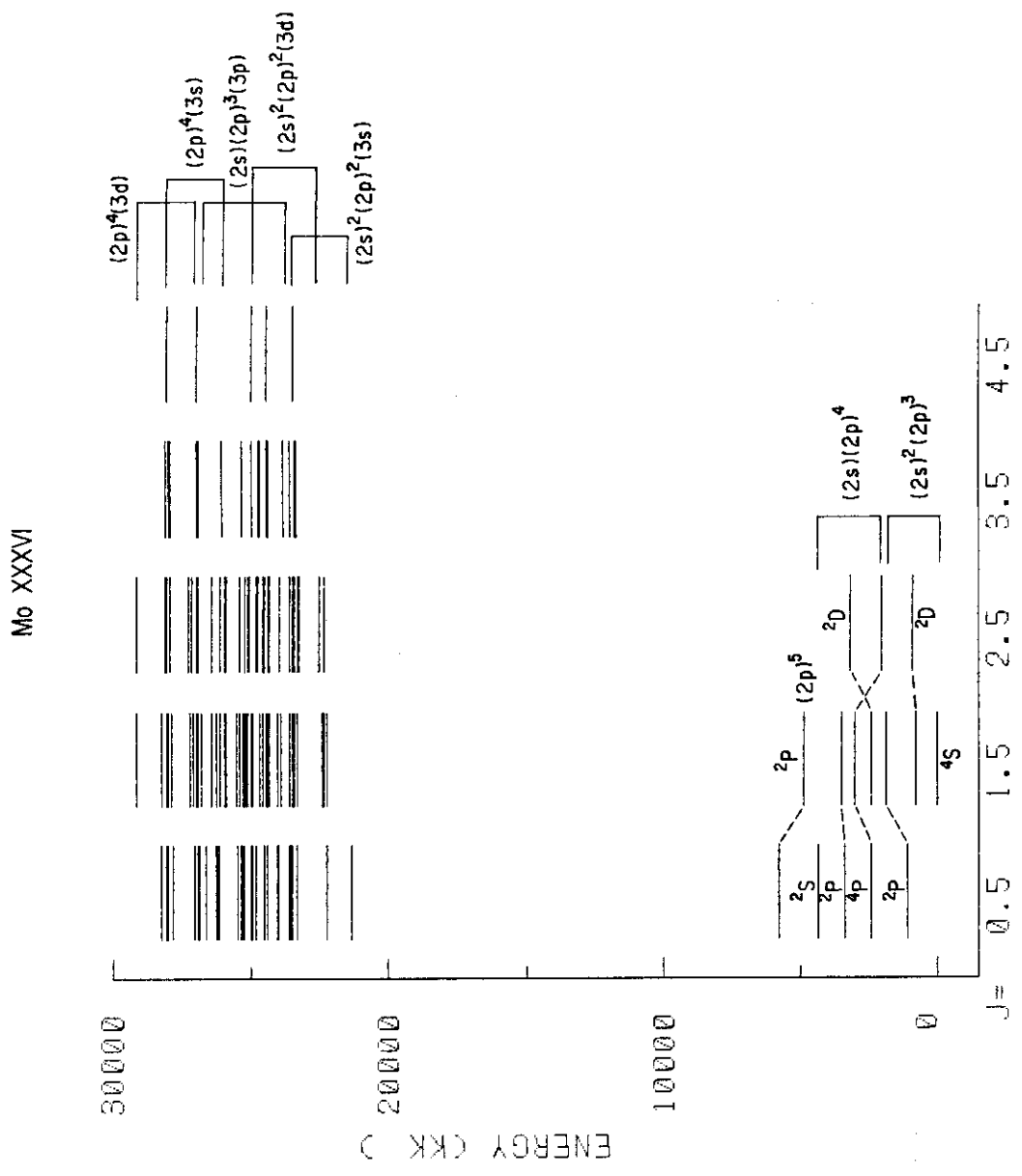
NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
51	989.685	2.0	22869.484	3.0	4.570	0.0286	0.9128E+13
52	989.685	2.0	22909.215	1.0	4.562	0.0281	0.8994E+13
53	1925.171	0.0	23850.367	1.0	4.561	0.0368	0.1178E+14
54	989.685	2.0	22913.645	2.0	4.561	0.1841	0.5903E+14
55	-0.002	2.0	21929.680	2.0	4.560	1.0605	0.3402E+15
56	862.927	1.0	22810.719	1.0	4.556	0.3953	0.1270E+15
57	989.685	2.0	22948.574	2.0	4.554	0.1410	0.4533E+14
58	862.927	1.0	22834.031	2.0	4.551	0.6401	0.2061E+15
59	989.685	2.0	22971.262	1.0	4.549	0.6770	0.2182E+15
60	-0.002	2.0	22017.949	3.0	4.542	3.3602	0.1087E+16
61	1925.171	0.0	23942.352	1.0	4.542	0.0256	0.8284E+13
62	989.685	2.0	23014.141	3.0	4.540	1.6388	0.5302E+15
63	-0.002	2.0	22041.484	1.0	4.537	0.0528	0.1712E+14
64	989.685	2.0	23037.309	2.0	4.536	1.2770	0.4140E+15
65	862.927	1.0	22909.965	0.0	4.536	0.2168	0.7028E+14
66	862.927	1.0	22909.215	1.0	4.536	0.3917	0.1270E+15
67	862.927	1.0	22913.645	2.0	4.535	0.8335	0.2703E+15
68	862.927	1.0	22948.574	2.0	4.528	0.3944	0.1283E+15
69	989.685	2.0	23086.383	2.0	4.526	0.9070	0.2954E+15
70	989.685	2.0	23094.703	3.0	4.524	2.8116	0.9163E+15
71	862.927	1.0	22971.262	1.0	4.523	0.2391	0.7793E+14
72	989.685	2.0	23103.422	1.0	4.522	0.1025	0.3344E+14
73	989.685	2.0	23136.367	2.0	4.515	0.0125	0.4076E+13
74	1925.171	0.0	24088.285	1.0	4.512	2.4280	0.7955E+15
75	862.927	1.0	23037.309	2.0	4.510	0.1157	0.3793E+14
76	989.685	2.0	23162.734	3.0	4.510	0.0606	0.1987E+14
77	1925.171	0.0	24129.934	1.0	4.504	0.0247	0.8129E+13
78	862.927	1.0	23086.383	2.0	4.500	1.5297	0.5039E+15
79	862.927	1.0	23103.422	1.0	4.496	0.3500	0.1155E+15
80	862.927	1.0	23136.367	2.0	4.490	0.0207	0.6843E+13
81	989.685	2.0	23401.711	3.0	4.462	0.0198	0.6646E+13
82	196.610	0.0	22656.078	1.0	4.452	0.0191	0.6415E+13
83	989.685	2.0	23529.070	2.0	4.437	0.0159	0.5379E+13
84	196.610	0.0	22810.719	1.0	4.422	0.0147	0.5026E+13
85	1925.171	0.0	24549.887	1.0	4.420	0.0166	0.5653E+13
86	-0.002	2.0	22632.367	1.0	4.418	0.0133	0.4539E+13
87	-0.002	2.0	22656.078	1.0	4.414	0.0780	0.2670E+14
88	862.927	1.0	23529.070	2.0	4.412	0.0463	0.1588E+14
89	-0.002	2.0	22666.047	2.0	4.412	0.2820	0.9664E+14
90	862.927	1.0	23543.215	1.0	4.409	0.0319	0.1095E+14
91	-0.002	2.0	22702.094	3.0	4.405	0.5822	0.2001E+15
92	862.927	1.0	23567.820	2.0	4.404	0.0169	0.5807E+13
93	196.610	0.0	22909.215	1.0	4.403	0.0847	0.2914E+14
94	-0.002	2.0	22731.660	3.0	4.399	0.1666	0.5743E+14
95	196.610	0.0	22971.262	1.0	4.391	0.0921	0.3187E+14
96	989.685	2.0	23787.391	3.0	4.386	0.0233	0.8088E+13
97	-0.002	2.0	22810.719	1.0	4.384	0.1525	0.5294E+14
98	-0.002	2.0	22834.031	2.0	4.379	0.9142	0.3179E+15
99	989.685	2.0	23850.367	1.0	4.374	0.1276	0.4449E+14
100	-0.002	2.0	22869.484	3.0	4.373	3.3082	0.1154E+16

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
101	989.685	2.0	23885.805	2.0	4.368	0.0599	0.2095E+14
102	196.610	0.0	23103.422	1.0	4.366	1.4123	0.4943E+15
103	989.685	2.0	23896.430	3.0	4.366	3.3248	0.1164E+16
104	1925.171	0.0	24835.566	1.0	4.365	0.0293	0.1024E+14
105	862.927	1.0	23772.750	0.0	4.365	0.0311	0.1088E+14
106	-0.002	2.0	22909.215	1.0	4.365	0.8843	0.3095E+15
107	-0.002	2.0	22913.645	2.0	4.364	1.3601	0.4763E+15
108	862.927	1.0	23788.559	2.0	4.362	0.0103	0.3614E+13
109	989.685	2.0	23922.430	2.0	4.361	1.0537	0.3696E+15
110	989.685	2.0	23933.324	3.0	4.359	0.0482	0.1694E+14
111	862.927	1.0	23818.734	0.0	4.356	0.3651	0.1283E+15
112	862.927	1.0	23822.719	1.0	4.355	0.0658	0.2314E+14
113	-0.002	2.0	22971.262	1.0	4.353	0.3626	0.1276E+15
114	862.927	1.0	23842.078	2.0	4.352	0.0445	0.1567E+14
115	862.927	1.0	23850.367	1.0	4.350	0.7898	0.2784E+15
116	-0.002	2.0	23014.141	3.0	4.345	0.1601	0.5655E+14
117	862.927	1.0	23885.805	2.0	4.344	0.1719	0.6078E+14
118	862.927	1.0	23922.430	2.0	4.337	0.8108	0.2876E+15
119	862.927	1.0	23942.352	1.0	4.333	0.0685	0.2435E+14
120	-0.002	2.0	23086.383	2.0	4.332	0.1636	0.5817E+14
121	-0.002	2.0	23094.703	3.0	4.330	0.0313	0.1113E+14
122	989.685	2.0	24088.285	1.0	4.329	0.0340	0.1208E+14
123	-0.002	2.0	23103.422	1.0	4.328	0.0136	0.4832E+13
124	-0.002	2.0	23136.367	2.0	4.322	0.0184	0.6561E+13
125	989.685	2.0	24129.934	1.0	4.321	0.0585	0.2088E+14
126	-0.002	2.0	23162.734	3.0	4.317	0.0887	0.3174E+14
127	989.685	2.0	24187.199	2.0	4.311	0.0223	0.7996E+13
128	862.927	1.0	24088.285	1.0	4.306	0.1282	0.4612E+14
129	862.927	1.0	24129.934	1.0	4.298	0.0269	0.9700E+13
130	862.927	1.0	24187.199	2.0	4.287	0.2094	0.7598E+14
131	196.610	0.0	23526.109	1.0	4.286	0.0448	0.1625E+14
132	196.610	0.0	23543.215	1.0	4.283	0.0240	0.8734E+13
133	989.685	2.0	24355.293	3.0	4.280	0.1788	0.6509E+14
134	989.685	2.0	24392.414	3.0	4.273	0.2090	0.7633E+14
135	-0.002	2.0	23401.711	3.0	4.273	0.3805	0.1390E+15
136	-0.002	2.0	23429.855	1.0	4.268	0.1638	0.5997E+14
137	989.685	2.0	24483.215	2.0	4.256	0.1812	0.6669E+14
138	-0.002	2.0	23526.109	1.0	4.251	0.0491	0.1813E+14
139	-0.002	2.0	23529.070	2.0	4.250	0.0269	0.9936E+13
140	-0.002	2.0	23543.215	1.0	4.248	0.2459	0.9091E+14
141	862.927	1.0	24419.422	1.0	4.245	0.1899	0.7030E+14
142	862.927	1.0	24427.520	2.0	4.244	0.2544	0.9421E+14
143	989.685	2.0	24549.887	1.0	4.244	0.0442	0.1635E+14
144	-0.002	2.0	23567.820	2.0	4.243	0.6818	0.2526E+15
145	196.610	0.0	23822.719	1.0	4.233	0.3384	0.1260E+15
146	989.685	2.0	24612.191	2.0	4.233	0.1824	0.6788E+14
147	196.610	0.0	23850.367	1.0	4.228	0.0119	0.4431E+13
148	989.685	2.0	24648.590	3.0	4.227	0.3547	0.1324E+15
149	862.927	1.0	24519.246	0.0	4.227	0.0617	0.2302E+14
150	989.685	2.0	24654.766	2.0	4.226	0.3855	0.1440E+15

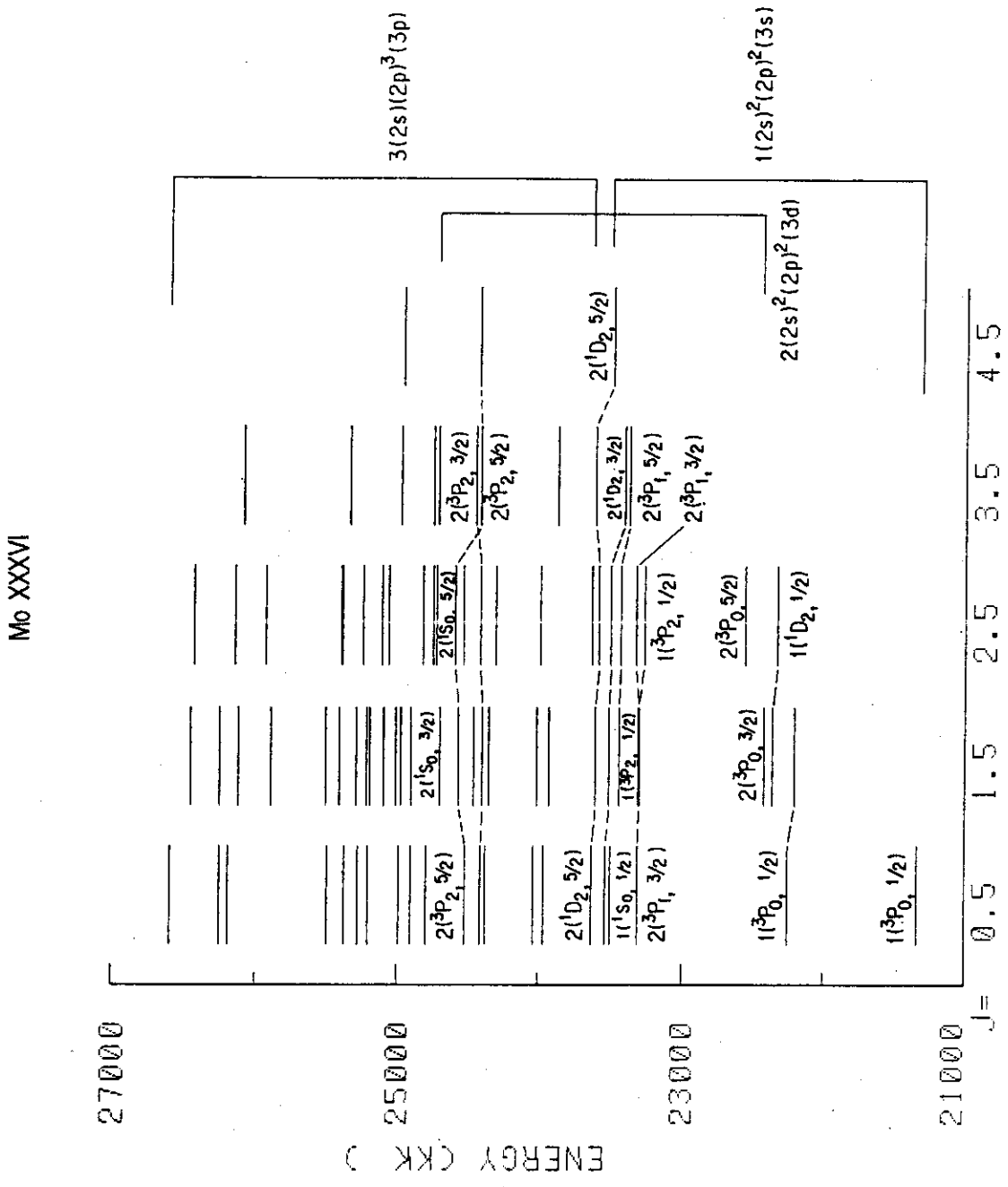
NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
151	862.927	1.0	24549.887	1.0	4.222	0.1419	0.5312E+14
152	989.685	2.0	24675.805	1.0	4.222	0.3697	0.1383E+15
153	1925.171	0.0	25610.895	1.0	4.222	0.2310	0.8645E+14
154	862.927	1.0	24586.270	0.0	4.215	0.1158	0.4347E+14
155	862.927	1.0	24612.191	2.0	4.211	0.0255	0.9612E+13
156	196.610	0.0	23942.352	1.0	4.211	0.0376	0.1414E+14
157	-0.002	2.0	23788.559	2.0	4.204	0.0455	0.1718E+14
158	-0.002	2.0	23787.391	3.0	4.204	0.4538	0.1713E+15
159	862.927	1.0	24654.766	2.0	4.203	0.0385	0.1453E+14
160	989.685	2.0	24781.117	1.0	4.203	0.0774	0.2922E+14
161	989.685	2.0	24835.566	1.0	4.194	0.0353	0.1338E+14
162	-0.002	2.0	23842.078	2.0	4.194	0.0105	0.3994E+13
163	1925.171	0.0	25795.504	1.0	4.189	0.2851	0.1084E+15
164	-0.002	2.0	23885.805	2.0	4.187	0.0159	0.6034E+13
165	989.685	2.0	24902.176	2.0	4.182	0.1569	0.5985E+14
166	862.927	1.0	24781.117	1.0	4.181	0.0102	0.3893E+13
167	989.685	2.0	24905.391	3.0	4.181	0.3828	0.1460E+15
168	862.927	1.0	24791.230	2.0	4.179	0.2719	0.1038E+15
169	-0.002	2.0	23933.324	3.0	4.178	0.0272	0.1040E+14
170	-0.002	2.0	23942.352	1.0	4.177	0.0579	0.2215E+14
171	862.927	1.0	24835.566	1.0	4.171	0.0745	0.2855E+14
172	862.927	1.0	24902.176	2.0	4.160	0.0159	0.6123E+13
173	989.685	2.0	25039.840	1.0	4.158	0.0188	0.7242E+13
174	-0.002	2.0	24129.934	1.0	4.144	0.0153	0.5932E+13
175	862.927	1.0	25039.840	1.0	4.136	0.0402	0.1566E+14
176	-0.002	2.0	24392.414	3.0	4.100	0.0331	0.1313E+14
177	-0.002	2.0	24427.520	2.0	4.094	0.0144	0.5732E+13
178	-0.002	2.0	24612.191	2.0	4.063	0.0137	0.5530E+13
179	196.610	0.0	24835.566	1.0	4.059	0.0114	0.4606E+13
180	-0.002	2.0	24905.391	3.0	4.015	0.0321	0.1329E+14
181	862.927	1.0	25785.344	2.0	4.012	0.0228	0.9437E+13
182	989.685	2.0	26797.711	3.0	3.875	0.0160	0.7123E+13



Mo XXXVI　グロトリアン・ダイアグラム



Mo XXXVI　エネルギーレベル



Mo XXXVI エネルギーレベル

$(2s)^2(2p)^2(3d)$, $(2s)^2(2p)^2(3s)$, $(2s)(2p)^3(3p)$

Mo XXXVI　エネルギーレベル

ODD　1　$(2s)^2\ (2p)^3$

　　2　$(2p)^5$

EVEN　1　$(2s)\ (2p)^4$

ODD PARITY

J	NO	ENERGY(KK)		LEADING PERCENTAGES				
0.5	1	1096.408	---	1	2P	99.3%		
0.5	2	5804.008	---	2	2P	99.3%		
1.5	1	0.002	---	1	2P	41.4%	1	4S 35.7%
1.5	2	801.119	---	1	4S	50.0%	1	2D 47.9%
1.5	3	1905.637	---	1	2P	55.4%	1	2D 29.4%
1.5	4	4885.820	---	2	2P	98.8%	1	2P 1.1%
2.5	1	946.149	---	1	2D	100.0%		

EVEN PARITY

J	NO	ENERGY(KK)		LEADING PERCENTAGES				
0.5	1	2414.819	---	1	4P	49.5%	1	2S 47.3%
0.5	2	3390.641	---	1	2P	52.1%	1	4P 32.4%
0.5	3	4340.398	---	1	2P	44.7%	1	2S 37.2%
1.5	1	2431.662	---	1	4P	42.4%	1	2D 31.1%
1.5	2	3008.226	---	1	4P	56.6%	1	2D 31.8%
1.5	3	3501.343	---	1	2P	62.0%	1	2D 37.0%
2.5	1	2048.896	---	1	4P	82.7%	1	2D 17.3%
2.5	2	3212.381	---	1	2D	82.7%	1	4P 17.3%

Mo XXXVI エネルギーレベル n＝3

EVEN 1 $(2s)^2\ (2p)^2\ (3s)$

2 $(2s)^2\ (2p)^2\ (3d)$

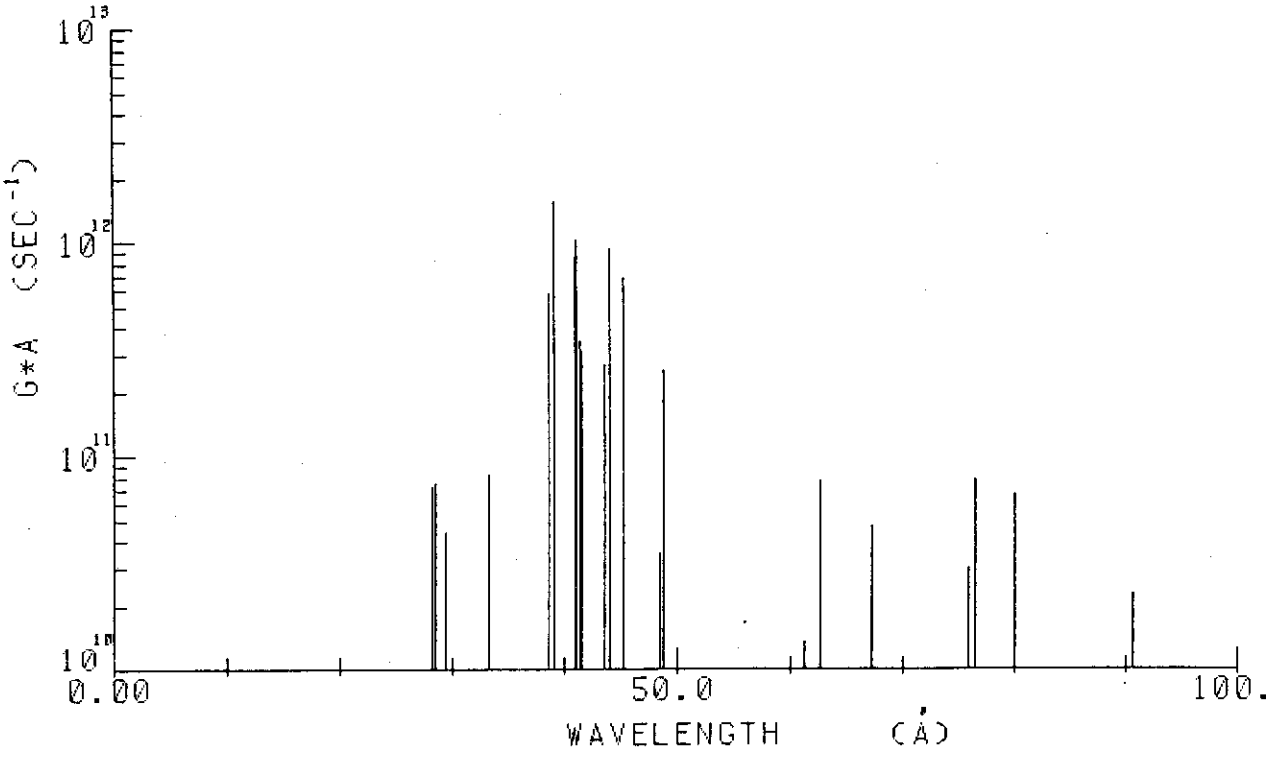
3 $(2s)\ (2p)^3\ (3p)$

EVEN PARITY

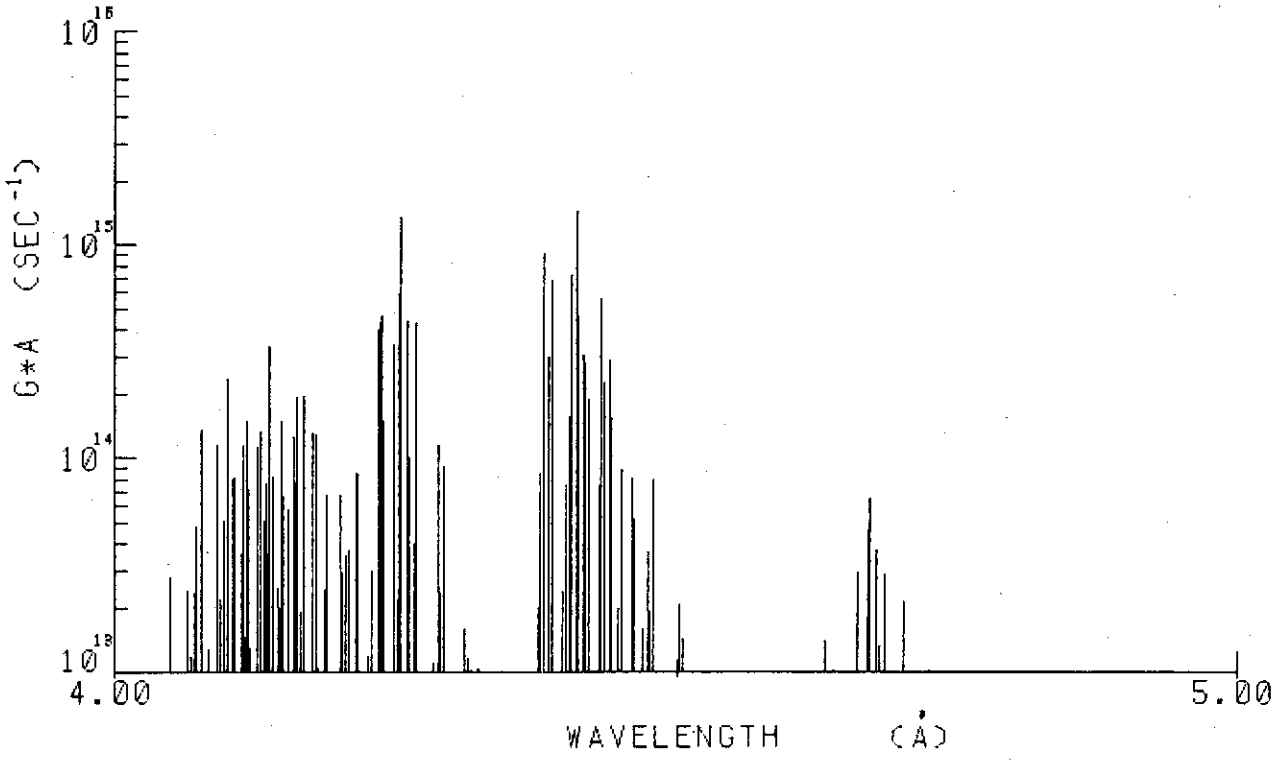
J	NO	ENERGY(KK)		LEADING PERCENTAGES	
0.5	1	21339.516	---	1 (3P) 4P 52.4%	1 (1S) 2S 24.9%
0.5	2	22254.883	---	1 (3P) 2P 68.3%	1 (3P) 4P 30.7%
0.5	3	23313.980	---	2 (3P) 4D 80.1%	2 (3P) 2P 13.8%
0.5	4	23501.180	---	1 (1S) 2S 63.4%	1 (3P) 4P 14.6%
0.5	5	23534.730	---	2 (3P) 4P 42.0%	2 (1D) 2P 26.0%
0.5	6	23637.027	---	2 (3P) 2P 41.0%	2 (1D) 2P 25.7%
0.5	7	23975.348	---	3 (2D) 4D 27.1%	3 (4S) 4P 21.8%
0.5	8	24046.953	---	3 (4S) 4P 28.9%	3 (2D) 2P 22.8%
0.5	9	24381.879	---	3 (2D) 4P 29.7%	3 (2P) 4P 14.2%
0.5	10	24419.910	---	2 (1D) 2P 44.4%	2 (3P) 2P 19.2%
0.5	11	24518.695	---	2 (1D) 2S 46.5%	2 (3P) 4P 31.2%
0.5	12	24793.070	---	3 (2D) 2P 26.8%	3 (4S) 4P 24.7%
0.5	13	24900.937	---	3 (2P) 4D 61.5%	3 (2P) 2P 23.6%
0.5	14	24993.930	---	3 (4S) 4P 40.7%	3 (2D) 2P 21.2%
0.5	15	25209.641	---	3 (2P) 4P 32.6%	3 (2P) 2S 17.9%
0.5	16	25274.578	---	3 (2D) 2P 19.8%	3 (2P) 2P 19.3%
0.5	17	25373.285	---	3 (2P) 2S 20.5%	3 (2P) 2P 19.3%
0.5	18	25492.340	---	3 (2D) 2P 32.9%	3 (4S) 2P 25.1%
0.5	20	26194.340	---	3 (2D) 2P 19.5%	3 (2P) 2S 19.4%
0.5	21	26248.336	---	3 (2P) 2P 30.6%	3 (4S) 4P 13.4%
0.5	22	26600.105	---	3 (2P) 2S 25.5%	3 (4S) 2P 24.7%
1.5	1	22208.082	---	1 (3P) 4P 88.4%	1 (3P) 2P 9.6%
1.5	2	22359.437	---	1 (1D) 2D 58.6%	1 (3P) 2P 38.7%
1.5	3	22422.520	---	2 (3P) 4F 37.9%	2 (1S) 2D 24.9%
1.5	4	23295.691	---	2 (3P) 4F 35.6%	2 (3P) 2P 28.7%
1.5	5	23314.207	---	1 (3P) 2P 42.4%	1 (1D) 2D 32.8%
1.5	6	23438.324	---	2 (3P) 4D 40.7%	2 (3P) 2P 25.5%
1.5	7	23512.262	---	2 (3P) 4P 41.6%	2 (1D) 2P 26.7%
1.5	8	23609.863	---	3 (4S) 6P 25.7%	2 (3P) 2D 15.3%
1.5	9	23615.316	---	2 (3P) 2D 28.2%	2 (1D) 2D 18.3%
1.5	10	23928.418	---	3 (4S) 4P 37.2%	3 (2P) 2P 18.6%
1.5	11	24021.031	---	3 (2D) 4F 32.3%	3 (2P) 2D 15.0%
1.5	12	24356.680	---	3 (2D) 4D 27.3%	3 (2P) 2P 13.5%
1.5	13	24407.891	---	2 (1D) 2D 32.9%	2 (3P) 4P 19.9%
1.5	14	24463.289	---	3 (4S) 6P 25.8%	3 (2D) 4D 18.5%
1.5	15	24566.477	---	2 (1D) 2P 33.9%	2 (3P) 2P 20.6%
1.5	16	24698.258	---	2 (1S) 2D 56.9%	2 (3P) 2D 21.2%
1.5	17	24900.824	---	3 (4S) 4P 29.7%	3 (2D) 2D 21.8%
1.5	18	24977.133	---	3 (2P) 4D 20.2%	3 (2D) 2P 16.1%
1.5	19	25013.750	---	3 (2D) 2P 39.6%	3 (2D) 4D 13.1%
1.5	20	25099.230	---	3 (2P) 4D 18.8%	3 (2P) 2D 14.4%
1.5	21	25193.922	---	3 (2P) 4P 34.0%	3 (2P) 2D 19.7%
1.5	22	25219.785	---	3 (2D) 2P 19.3%	3 (4S) 4P 16.1%
1.5	23	25287.434	---	3 (2P) 2D 25.6%	3 (2D) 4D 15.1%
1.5	24	25411.297	---	3 (2P) 2P 14.4%	3 (2D) 2P 14.4%
1.5	25	25504.770	---	3 (2D) 2D 14.8%	3 (2D) 2D 13.5%
1.5	26	25892.113	---	3 (2P) 4P 22.1%	3 (2D) 2P 18.3%
1.5	28	26117.660	---	3 (2P) 2P 25.4%	3 (2D) 2D 18.5%
1.5	29	26251.805	---	3 (2P) 2D 35.3%	3 (4S) 2P 15.2%

EVEN PARITY

J	NO	ENERGY(KK)		LEADING PERCENTAGES	
1.5	30	26456.531	---	3 (2P) 2P 37.2%	3 (4S) 2P 17.1%
2.5	1	22325.695	---	1 (1D) 2D 55.2%	1 (3P) 4P 42.7%
2.5	2	22558.918	---	2 (1S) 2D 24.2%	2 (3P) 4D 21.8%
2.5	3	23267.125	---	1 (3P) 4P 53.8%	1 (1D) 2D 41.9%
2.5	4	23318.125	---	2 (3P) 4F 55.9%	2 (3P) 2F 17.7%
2.5	5	23428.223	---	2 (3P) 4P 39.2%	2 (3P) 2F 22.9%
2.5	6	23504.293	---	2 (3P) 4D 37.8%	2 (1D) 2D 27.6%
2.5	7	23582.594	---	2 (3P) 2D 31.1%	2 (1D) 2D 27.0%
2.5	8	23636.145	---	3 (4S) 6P 31.0%	3 (4S) 4P 16.8%
2.5	9	23993.395	---	3 (4S) 4P 27.3%	3 (4S) 6P 24.4%
2.5	10	24306.016	---	3 (2D) 4F 24.9%	3 (2P) 2D 17.3%
2.5	11	24416.930	---	2 (3P) 4D 25.0%	2 (1D) 2D 23.5%
2.5	12	24533.922	---	3 (2D) 4F 24.1%	3 (2D) 4D 18.2%
2.5	13	24598.613	---	2 (3P) 2D 39.2%	2 (1D) 2D 17.7%
2.5	14	24721.203	---	2 (1S) 2D 62.3%	2 (3P) 2F 14.2%
2.5	15	24747.090	---	3 (2D) 4D 33.1%	3 (4S) 4P 18.2%
2.5	16	24823.379	---	3 (2D) 4P 58.6%	3 (2D) 2D 21.2%
2.5	17	25065.293	---	3 (2D) 2F 47.3%	3 (2D) 4F 14.4%
2.5	18	25115.312	---	3 (2D) 2D 58.6%	3 (2D) 4P 20.7%
2.5	19	25245.992	---	3 (4S) 4P 33.1%	3 (2D) 4F 15.5%
2.5	20	25381.863	---	3 (4S) 4P 20.7%	3 (2D) 2D 18.3%
2.5	21	25403.008	---	3 (2P) 4D 22.3%	3 (2D) 2D 18.3%
2.5	23	25924.480	---	3 (2P) 2D 29.9%	3 (2D) 2F 19.7%
2.5	24	26136.414	---	3 (2P) 4P 28.0%	3 (2D) 2D 24.7%
2.5	25	26434.988	---	3 (2P) 2D 48.6%	3 (4S) 4P 26.9%
3.5	1	23366.215	---	2 (3P) 4F 58.4%	2 (3P) 4D 32.1%
3.5	2	23411.008	---	2 (1D) 2G 30.8%	2 (1D) 2F 24.8%
3.5	3	23612.516	---	2 (1D) 2F 30.7%	2 (1D) 2G 28.3%
3.5	4	23875.262	---	3 (4S) 6P 54.1%	3 (2P) 4D 33.3%
3.5	5	24411.996	---	2 (3P) 4D 39.1%	2 (1D) 2F 38.9%
3.5	6	24455.258	---	2 (3P) 2F 44.2%	2 (1D) 2G 34.2%
3.5	7	24708.656	---	3 (2D) 4F 52.4%	3 (2D) 2F 21.2%
3.5	8	24749.637	---	3 (4S) 6P 29.3%	3 (2D) 2F 25.8%
3.5	9	24973.160	---	3 (2D) 4D 59.3%	3 (2D) 2F 39.1%
3.5	10	25338.504	---	3 (2D) 2F 60.4%	3 (2D) 4F 15.7%
3.5	11	26086.969	---	3 (2P) 4D 47.4%	3 (2D) 2F 32.6%
4.5	1	23490.020	---	2 (1D) 2G 54.4%	2 (3P) 4F 45.1%
4.5	2	24429.508	---	2 (3P) 4F 53.3%	2 (1D) 2G 44.8%
4.5	3	24968.535	---	3 (2D) 4F 98.9%	



Mo XXXVI　スペクトル・パターン
$(2s)^2\ (2p)^3 - (2s)\ (2p)^4$



Mo XXXVI　スペクトル・パターン
$(2s)^2\ (2p)^3 - (2s)^2\ (2p)^2\ (3s)$
$(2s)^2\ (2p)^2\ (3d)$
$(2s)\ (2p)^3\ (3p)$

Mo XXXVI　波長，振動子強度

$(2s)^2(2p)^3 - (2s)(2p)^4$

$(2s)^2(2p)^2(3s)$

$(2s)^2(2p)^2(3d)$

$(2s)(2p)^3(3p)$

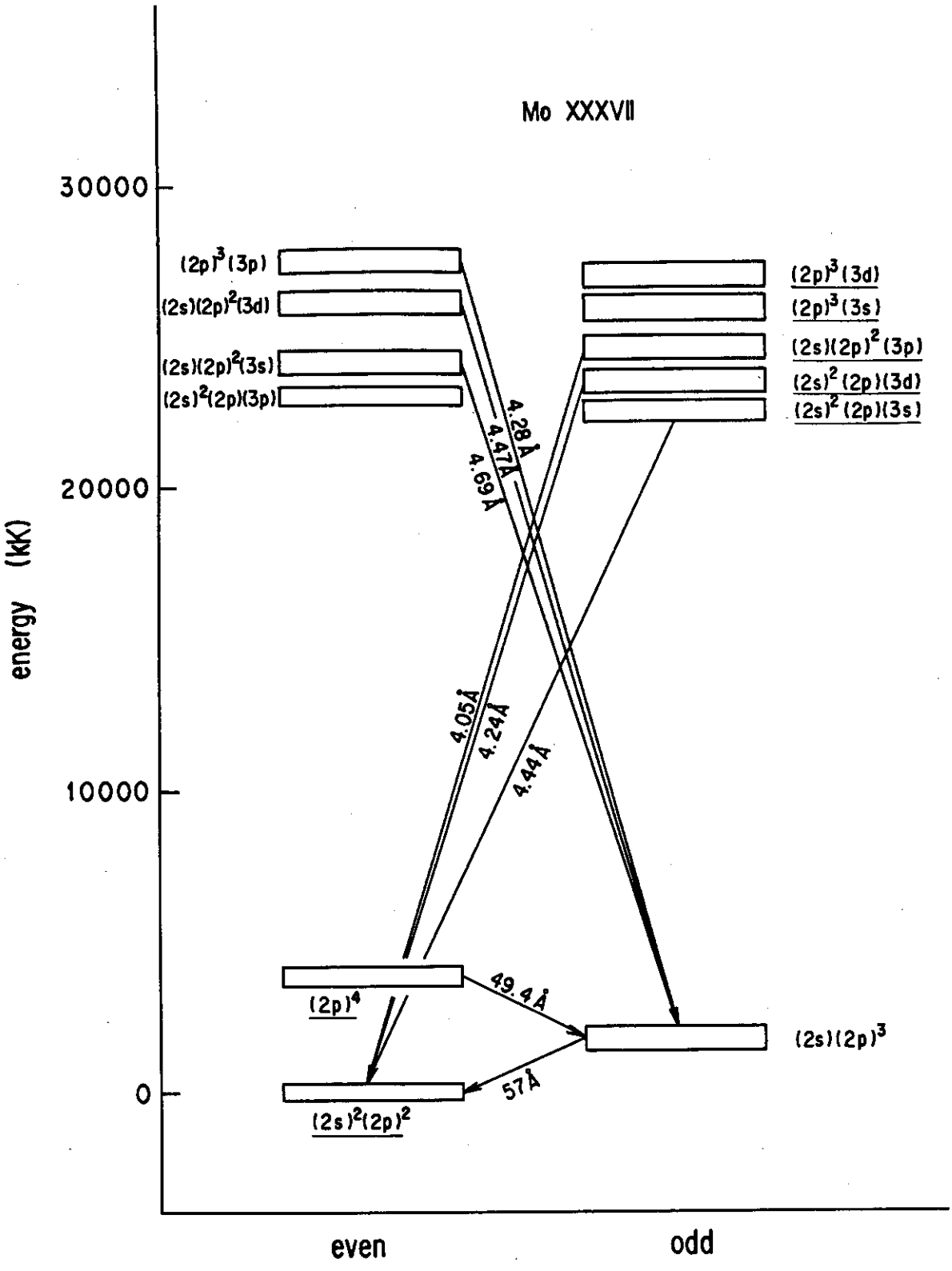
NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
1	1905.637	1.5	2048.895	2.5	698.041	0.0001	0.1816E+07
2	1905.637	1.5	2414.819	0.5	196.393	0.0004	0.6729E+08
3	1905.637	1.5	2431.661	1.5	190.105	0.0031	0.5734E+09
4	1905.637	1.5	3008.226	1.5	90.696	0.0021	0.1738E+10
5	946.149	2.5	2048.895	2.5	90.683	0.0280	0.2274E+11
6	801.119	1.5	2048.895	2.5	80.143	0.0638	0.6626E+11
7	1905.637	1.5	3212.380	2.5	76.526	0.0680	0.7744E+11
8	1096.407	0.5	2414.819	0.5	75.849	0.0260	0.3014E+11
9	1096.407	0.5	2431.661	1.5	74.892	0.0008	0.9205E+09
10	1905.637	1.5	3390.641	0.5	67.340	0.0062	0.9052E+10
11	946.149	2.5	2431.661	1.5	67.317	0.0320	0.4716E+11
12	1905.637	1.5	3501.342	1.5	62.668	0.0452	0.7670E+11
13	801.119	1.5	2414.819	0.5	61.969	0.0021	0.3730E+10
14	801.119	1.5	2431.661	1.5	61.329	0.0076	0.1343E+11
15	1096.407	0.5	3008.226	1.5	52.306	0.0039	0.9538E+10
16	0.002	1.5	2048.895	2.5	48.807	0.0906	0.2537E+12
17	946.149	2.5	3008.226	1.5	48.495	0.0124	0.3503E+11
18	801.119	1.5	3008.226	1.5	45.308	0.2120	0.6889E+12
19	946.149	2.5	3212.380	2.5	44.126	0.2757	0.9445E+12
20	1096.407	0.5	3390.641	0.5	43.588	0.0764	0.2682E+12
21	1096.407	0.5	3501.342	1.5	41.581	0.0810	0.3123E+12
22	801.119	1.5	3212.380	2.5	41.472	0.0078	0.3007E+11
23	0.002	1.5	2414.819	0.5	41.411	0.0884	0.3437E+12
24	0.002	1.5	2431.661	1.5	41.124	0.2622	0.1034E+13
25	1905.637	1.5	4340.395	0.5	41.072	0.2165	0.8561E+12
26	946.149	2.5	3501.342	1.5	39.136	0.3591	0.1564E+13
27	801.119	1.5	3390.641	0.5	38.617	0.1303	0.5827E+12
28	0.002	1.5	3008.226	1.5	33.242	0.0137	0.8250E+11
29	0.002	1.5	3390.641	0.5	29.493	0.0057	0.4406E+11
30	0.002	1.5	3501.342	1.5	28.560	0.0092	0.7556E+11
31	801.119	1.5	4340.395	0.5	28.254	0.0087	0.7232E+11
32	1096.407	0.5	22254.879	0.5	4.726	0.0345	0.1031E+14
33	1096.407	0.5	22359.422	1.5	4.703	0.0710	0.2142E+14
34	946.149	2.5	22208.078	1.5	4.703	0.0188	0.5683E+13
35	0.004	1.5	21339.504	0.5	4.686	0.0944	0.2866E+14
36	1905.637	1.5	23267.117	2.5	4.681	0.0440	0.1341E+14
37	946.149	2.5	22325.680	2.5	4.677	0.1234	0.3762E+14
38	1905.637	1.5	23295.680	1.5	4.675	0.0141	0.4313E+13
39	1905.637	1.5	23314.191	1.5	4.671	0.2134	0.6524E+14
40	801.121	1.5	22208.078	1.5	4.671	0.0693	0.2120E+14
41	946.149	2.5	22359.422	1.5	4.670	0.1526	0.4666E+14
42	801.121	1.5	22254.879	0.5	4.661	0.0959	0.2943E+14
43	801.121	1.5	22359.422	1.5	4.639	0.0332	0.1031E+14
44	1905.637	1.5	23501.168	0.5	4.631	0.0452	0.1406E+14
45	1905.637	1.5	23637.023	0.5	4.602	0.0139	0.4393E+13
46	1096.407	0.5	23295.680	1.5	4.505	0.0437	0.1437E+14
47	0.004	1.5	22208.078	1.5	4.503	0.0635	0.2089E+14
48	1096.407	0.5	23313.965	0.5	4.501	0.0316	0.1041E+14
49	0.004	1.5	22254.879	0.5	4.493	0.0252	0.8327E+13
50	946.149	2.5	23267.117	2.5	4.480	0.1805	0.5998E+14

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
51	0.004	1.5	22325.680	2.5	4.479	0.2398	0.7971E+14
52	1096.407	0.5	23438.316	1.5	4.476	0.0581	0.1935E+14
53	946.149	2.5	23295.680	1.5	4.474	0.1102	0.3672E+14
54	0.004	1.5	22359.422	1.5	4.472	0.0262	0.8744E+13
55	946.149	2.5	23314.191	1.5	4.471	0.0262	0.8732E+13
56	946.149	2.5	23318.109	2.5	4.470	0.0483	0.1612E+14
57	1096.407	0.5	23501.168	0.5	4.463	0.1541	0.5158E+14
58	1096.407	0.5	23512.254	1.5	4.461	0.0944	0.3165E+14
59	0.004	1.5	22422.512	1.5	4.460	0.2425	0.8132E+14
60	946.149	2.5	23366.207	3.5	4.460	0.1104	0.3702E+14
61	1096.407	0.5	23534.719	0.5	4.457	0.0280	0.9405E+13
62	1905.637	1.5	24356.672	1.5	4.454	0.0098	0.3306E+13
63	801.121	1.5	23267.117	2.5	4.451	0.2617	0.8809E+14
64	1905.637	1.5	24381.871	0.5	4.449	0.0109	0.3671E+13
65	946.149	2.5	23428.207	2.5	4.448	0.0597	0.2011E+14
66	801.121	1.5	23295.680	1.5	4.446	0.0096	0.3251E+13
67	1096.407	0.5	23609.855	1.5	4.442	0.4580	0.1548E+15
68	801.121	1.5	23314.191	1.5	4.442	0.0804	0.2716E+14
69	801.121	1.5	23313.965	0.5	4.442	0.0563	0.1902E+14
70	1905.637	1.5	24416.926	2.5	4.442	0.0232	0.7843E+13
71	1096.407	0.5	23615.309	1.5	4.441	0.8543	0.2889E+15
72	1096.407	0.5	23637.023	0.5	4.436	0.6724	0.2278E+15
73	0.004	1.5	22558.910	2.5	4.433	1.6542	0.5615E+15
74	946.149	2.5	23504.285	2.5	4.433	0.6933	0.2353E+15
75	946.149	2.5	23512.254	1.5	4.431	0.2202	0.7480E+14
76	1905.637	1.5	24518.687	0.5	4.422	0.5566	0.1898E+15
77	801.121	1.5	23428.207	2.5	4.419	0.8135	0.2778E+15
78	801.121	1.5	23438.316	1.5	4.418	0.6713	0.2294E+15
79	946.149	2.5	23582.590	2.5	4.418	0.8903	0.3043E+15
80	1905.637	1.5	24566.461	1.5	4.413	1.3636	0.4670E+15
81	946.149	2.5	23612.512	3.5	4.412	4.2379	0.1452E+16
82	946.149	2.5	23609.855	1.5	4.412	0.1156	0.3962E+14
83	946.149	2.5	23615.309	1.5	4.411	0.0350	0.1198E+14
84	1905.637	1.5	24598.605	2.5	4.407	2.1179	0.7274E+15
85	801.121	1.5	23504.285	2.5	4.405	0.4573	0.1572E+15
86	801.121	1.5	23512.254	1.5	4.403	0.2191	0.7537E+14
87	801.121	1.5	23534.719	0.5	4.399	0.0696	0.2398E+14
88	801.121	1.5	23582.590	2.5	4.390	1.9986	0.6918E+15
89	1905.637	1.5	24698.254	1.5	4.387	0.8674	0.3006E+15
90	801.121	1.5	23609.855	1.5	4.384	0.0191	0.6644E+13
91	1905.637	1.5	24721.199	2.5	4.383	2.6748	0.9287E+15
92	801.121	1.5	23615.309	1.5	4.383	0.0282	0.9801E+13
93	801.121	1.5	23637.023	0.5	4.379	0.0394	0.1371E+14
94	801.121	1.5	23636.141	2.5	4.379	0.2460	0.8555E+14
95	1905.637	1.5	24747.086	2.5	4.378	0.0576	0.2005E+14
96	1096.407	0.5	24021.023	1.5	4.362	0.0139	0.4870E+13
97	946.149	2.5	23875.246	3.5	4.361	0.0174	0.6093E+13
98	1905.637	1.5	24993.918	0.5	4.331	0.0108	0.3844E+13
99	801.121	1.5	23928.414	1.5	4.324	0.0292	0.1041E+14
100	1905.637	1.5	25065.277	2.5	4.318	0.0287	0.1028E+14

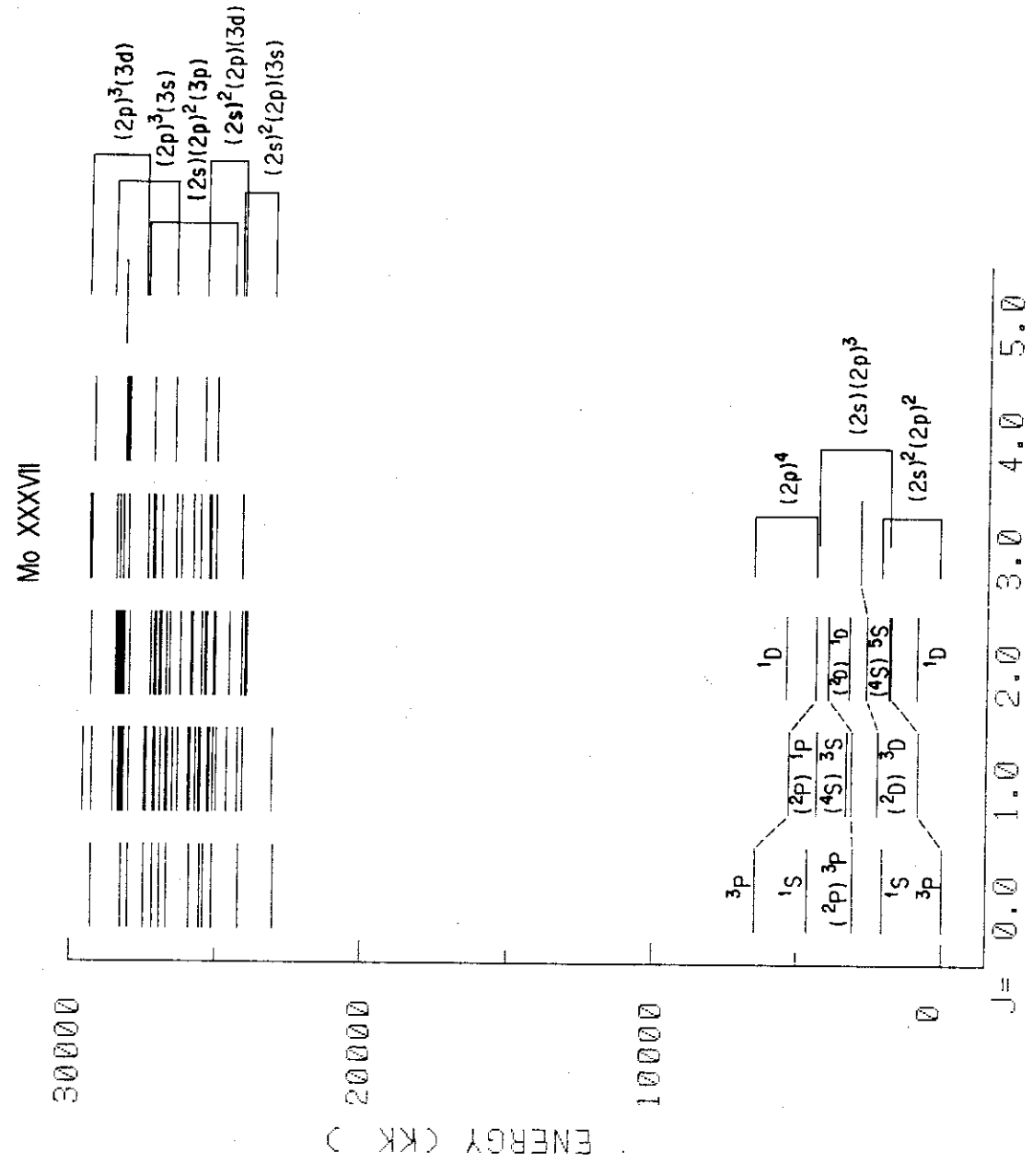
NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
101	801.121	1.5	23975.344	0.5	4.315	0.0326	0.1168E+14
102	801.121	1.5	23993.391	2.5	4.312	0.0446	0.1602E+14
103	801.121	1.5	24021.023	1.5	4.307	0.0280	0.1006E+14
104	0.004	1.5	23295.680	1.5	4.293	0.2560	0.9266E+14
105	1096.407	0.5	24407.887	1.5	4.290	0.0646	0.2342E+14
106	0.004	1.5	23318.109	2.5	4.289	0.3173	0.1151E+15
107	0.004	1.5	23314.191	1.5	4.289	0.0451	0.1634E+14
108	0.004	1.5	23313.965	0.5	4.289	0.0198	0.7176E+13
109	1096.407	0.5	24419.902	0.5	4.288	0.0156	0.5655E+13
110	1905.637	1.5	25245.980	2.5	4.284	0.0306	0.1112E+14
111	0.004	1.5	23428.207	2.5	4.268	1.1715	0.4289E+15
112	0.004	1.5	23438.316	1.5	4.267	0.1100	0.4030E+14
113	946.149	2.5	24411.980	3.5	4.262	0.1751	0.6432E+14
114	946.149	2.5	24407.887	1.5	4.262	0.2729	0.1002E+15
115	946.149	2.5	24416.926	2.5	4.261	1.1965	0.4396E+15
116	1096.407	0.5	24566.461	1.5	4.261	0.3004	0.1104E+15
117	1905.637	1.5	25402.988	2.5	4.256	0.0266	0.9808E+13
118	0.004	1.5	23504.285	2.5	4.255	1.4996	0.5526E+15
119	0.004	1.5	23501.168	0.5	4.255	0.0439	0.1618E+14
120	946.149	2.5	24455.246	3.5	4.254	3.6547	0.1347E+16
121	1905.637	1.5	25411.293	1.5	4.254	0.0204	0.7535E+13
122	801.121	1.5	24306.000	2.5	4.254	0.0376	0.1386E+14
123	0.004	1.5	23512.254	1.5	4.253	1.6137	0.5950E+15
124	946.149	2.5	24463.277	1.5	4.252	0.0598	0.2206E+14
125	0.004	1.5	23534.719	0.5	4.249	0.9261	0.3421E+15
126	1905.637	1.5	25492.336	0.5	4.240	0.0101	0.3738E+13
127	0.004	1.5	23582.590	2.5	4.240	0.4012	0.1488E+15
128	946.149	2.5	24533.918	2.5	4.239	0.0197	0.7305E+13
129	1096.407	0.5	24698.254	1.5	4.237	1.2623	0.4690E+15
130	1905.637	1.5	25504.766	1.5	4.237	0.0182	0.6766E+13
131	801.121	1.5	24407.887	1.5	4.236	1.1680	0.4341E+15
132	946.149	2.5	24566.461	1.5	4.234	0.0271	0.1009E+14
133	801.121	1.5	24419.902	0.5	4.234	0.4688	0.1744E+15
134	801.121	1.5	24416.926	2.5	4.234	1.0778	0.4009E+15
135	0.004	1.5	23637.023	0.5	4.231	0.0136	0.5055E+13
136	946.149	2.5	24598.605	2.5	4.228	0.0795	0.2965E+14
137	801.121	1.5	24463.277	1.5	4.226	0.0318	0.1187E+14
138	801.121	1.5	24518.687	0.5	4.216	0.2224	0.8345E+14
139	801.121	1.5	24533.918	2.5	4.214	0.2272	0.8534E+14
140	801.121	1.5	24566.461	1.5	4.208	0.0379	0.1427E+14
141	946.149	2.5	24708.652	3.5	4.208	0.0996	0.3751E+14
142	946.149	2.5	24721.199	2.5	4.206	0.0934	0.3523E+14
143	801.121	1.5	24598.605	2.5	4.202	0.0774	0.2925E+14
144	1096.407	0.5	24900.926	0.5	4.201	0.0566	0.2138E+14
145	946.149	2.5	24749.629	3.5	4.201	0.1785	0.6747E+14
146	946.149	2.5	24823.375	2.5	4.188	0.1766	0.6717E+14
147	1096.407	0.5	24977.117	1.5	4.187	0.0646	0.2455E+14
148	1096.407	0.5	24993.918	0.5	4.185	0.0128	0.4865E+13
149	801.121	1.5	24698.254	1.5	4.185	0.0102	0.3880E+13
150	801.121	1.5	24721.199	2.5	4.181	0.0277	0.1056E+14

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
151	0.004	1.5	23928.414	1.5	4.179	0.3384	0.1292E+15
152	801.121	1.5	24747.086	2.5	4.176	0.3429	0.1311E+15
153	946.149	2.5	24900.812	1.5	4.175	0.0152	0.5819E+13
154	0.004	1.5	23975.344	0.5	4.171	0.0244	0.9338E+13
155	1905.637	1.5	25892.109	1.5	4.169	0.0675	0.2592E+14
156	0.004	1.5	23993.391	2.5	4.168	0.5064	0.1945E+15
157	801.121	1.5	24793.055	0.5	4.168	0.1868	0.7173E+14
158	1096.407	0.5	25099.215	1.5	4.166	0.0503	0.1934E+14
159	801.121	1.5	24823.375	2.5	4.163	0.0448	0.1723E+14
160	0.004	1.5	24021.023	1.5	4.163	0.1227	0.4721E+14
161	1905.637	1.5	25924.477	2.5	4.163	0.5001	0.1924E+15
162	946.149	2.5	24973.148	3.5	4.162	0.4062	0.1564E+15
163	1905.637	1.5	25939.773	1.5	4.161	0.0238	0.9166E+13
164	946.149	2.5	24977.117	1.5	4.161	0.1978	0.7617E+14
165	0.004	1.5	24046.941	0.5	4.159	0.3279	0.1265E+15
166	946.149	2.5	25013.742	1.5	4.155	0.1493	0.5769E+14
167	1096.407	0.5	25193.918	1.5	4.150	0.1700	0.6583E+14
168	801.121	1.5	24900.812	1.5	4.149	0.3835	0.1486E+15
169	1096.407	0.5	25209.629	0.5	4.147	0.0519	0.2013E+14
170	946.149	2.5	25065.277	2.5	4.146	0.0647	0.2511E+14
171	946.149	2.5	25099.215	1.5	4.140	0.2116	0.8233E+14
172	946.149	2.5	25115.309	2.5	4.138	0.8625	0.3360E+15
173	1096.407	0.5	25274.574	0.5	4.136	0.0923	0.3600E+14
174	801.121	1.5	24977.117	1.5	4.136	0.0283	0.1103E+14
175	1096.407	0.5	25287.422	1.5	4.134	0.1978	0.7721E+14
176	801.121	1.5	24993.918	0.5	4.133	0.1309	0.5110E+14
177	801.121	1.5	25013.742	1.5	4.130	0.1225	0.4791E+14
178	1905.637	1.5	26117.645	1.5	4.130	0.3429	0.1341E+15
179	1905.637	1.5	26136.398	2.5	4.127	0.2868	0.1123E+15
180	801.121	1.5	25065.277	2.5	4.121	0.0332	0.1302E+14
181	946.149	2.5	25219.773	1.5	4.120	0.1184	0.4654E+14
182	1096.407	0.5	25373.277	0.5	4.119	0.1819	0.7150E+14
183	1905.637	1.5	26194.336	0.5	4.117	0.3757	0.1478E+15
184	801.121	1.5	25099.215	1.5	4.116	0.0372	0.1464E+14
185	946.149	2.5	25245.980	2.5	4.115	0.0367	0.1444E+14
186	0.004	1.5	24306.000	2.5	4.114	0.2929	0.1154E+15
187	1096.407	0.5	25411.293	1.5	4.113	0.0905	0.3568E+14
188	801.121	1.5	25115.309	2.5	4.113	0.0116	0.4554E+13
189	946.149	2.5	25287.422	1.5	4.108	0.0117	0.4643E+13
190	1905.637	1.5	26251.789	1.5	4.107	0.2035	0.8043E+14
191	0.004	1.5	24356.672	1.5	4.106	0.2014	0.7968E+14
192	801.121	1.5	25193.918	1.5	4.100	0.0115	0.4556E+13
193	946.149	2.5	25338.492	3.5	4.100	0.5901	0.2342E+15
194	1096.407	0.5	25504.766	1.5	4.097	0.1278	0.5080E+14
195	801.121	1.5	25219.773	1.5	4.095	0.0546	0.2172E+14
196	946.149	2.5	25381.855	2.5	4.092	0.0477	0.1900E+14
197	801.121	1.5	25245.980	2.5	4.091	0.2881	0.1148E+15
198	946.149	2.5	25411.293	1.5	4.087	0.0218	0.8718E+13
199	801.121	1.5	25287.422	1.5	4.084	0.0324	0.1294E+14
200	1905.637	1.5	26434.973	2.5	4.077	0.3396	0.1363E+15

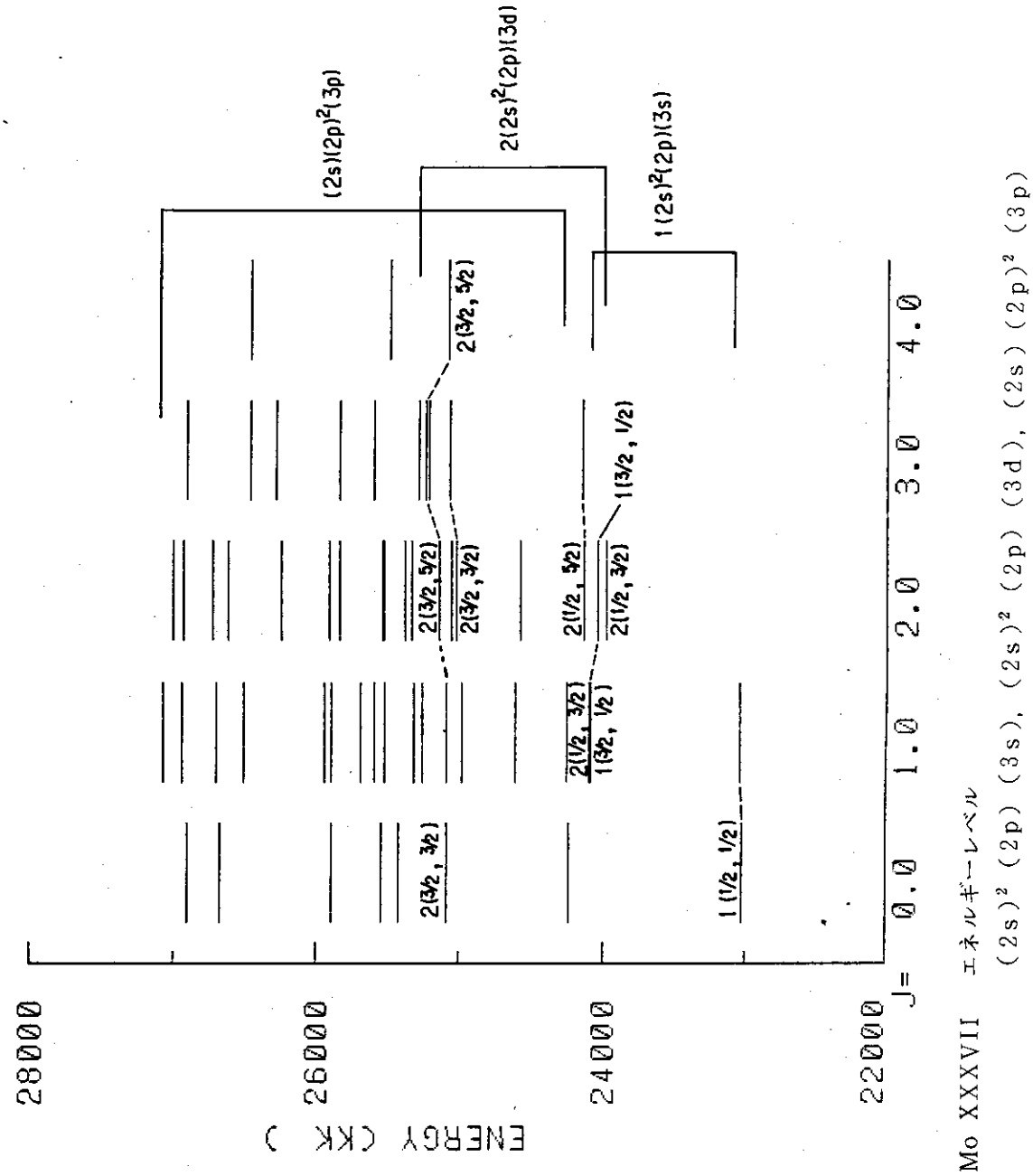
NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
201	1905.637	1.5	26456.527	1.5	4.073	0.1206	0.4849E+14
202	946.149	2.5	25504.766	1.5	4.072	0.0590	0.2372E+14
203	801.121	1.5	25381.855	2.5	4.068	0.0296	0.1194E+14
204	801.121	1.5	25402.988	2.5	4.065	0.0596	0.2407E+14
205	801.121	1.5	25492.336	0.5	4.050	0.0679	0.2762E+14
206	1905.637	1.5	26600.094	0.5	4.049	0.0178	0.7223E+13
207	0.004	1.5	24747.086	2.5	4.041	0.0111	0.4546E+13
208	0.004	1.5	24793.055	0.5	4.033	0.0107	0.4372E+13
209	946.149	2.5	25939.773	1.5	4.001	0.0133	0.5556E+13
210	1905.637	1.5	26950.527	2.5	3.993	0.0172	0.7216E+13
211	946.149	2.5	26086.957	3.5	3.978	0.0240	0.1013E+14
212	946.149	2.5	26117.645	1.5	3.973	0.0158	0.6665E+13
213	0.004	1.5	25381.855	2.5	3.940	0.0347	0.1493E+14
214	801.121	1.5	26434.973	2.5	3.901	0.0179	0.7829E+13
215	946.149	2.5	26930.719	3.5	3.848	0.0187	0.8415E+13
216	1905.637	1.5	28083.086	2.5	3.820	0.0130	0.5953E+13
217	946.149	2.5	28100.336	3.5	3.683	0.0128	0.6284E+13



Mo XXXVII　グロトリアン・ダイアグラム



Mo XXXVII　エネルギーレベル



Mo XXXVII エネルギーレベル

$(2s)^2(2p)(3s)$, $(2s)^2(2p)(3d)$, $(2s)(2p)^2(3p)$

Mo XXXVII　エネルギーレベル

EVEN　1　$(2s)^2$ $(2p)^2$

　　2　　$(2p)^4$

ODD　1　$(2s)$ $(2p)^3$

EVEN PARITY

J	NO	ENERGY(KK)		LEADING PERCENTAGES			
0.0	1	0.004	---	1	3P 74.6%	1	1S 24.8%
0.0	2	2082.011	---	1	1S 73.0%	1	3P 25.1%
0.0	3	4666.469	---	2	1S 51.7%	2	3P 46.7%
0.0	4	6457.316	---	2	3P 53.0%	2	1S 46.0%
1.0	1	842.142	---	1	3P 99.6%		
1.0	2	5303.316	---	2	3P 99.6%		
2.0	1	956.049	---	1	1D 57.2%	1	3P 42.5%
2.0	2	1860.778	---	1	3P 56.7%	1	1D 42.2%
2.0	3	4417.348	---	2	3P 73.6%	2	1D 25.3%
2.0	4	5432.395	---	2	1D 74.1%	2	3P 25.5%

ODD PARITY

J	NO	ENERGY(KK)		LEADING PERCENTAGES			
0.0	1	3082.716	---	1 (2P) 3P100.0%			
1.0	1	2251.651	---	1 (2D) 3D 47.2%		1 (2P) 3P 23.9%	
1.0	2	3166.955	---	1 (2P) 3P 36.3%		1 (2D) 3D 34.4%	
1.0	3	3303.295	---	1 (4S) 3S 33.5%		1 (2P) 3P 31.8%	
1.0	4	4322.496	---	1 (2P) 1P 49.9%		1 (4S) 3S 28.4%	
2.0	1	1852.617	---	1 (4S) 5S 54.3%		1 (2P) 3P 33.6%	
2.0	2	2679.707	---	1 (2D) 3D 54.8%		1 (4S) 5S 33.4%	
2.0	3	3259.708	---	1 (2D) 1D 61.6%		1 (2D) 3D 23.5%	
2.0	4	3986.199	---	1 (2P) 3P 47.7%		1 (2D) 1D 32.7%	
3.0	1	2899.732	---	1 (2D) 3D100.0%			

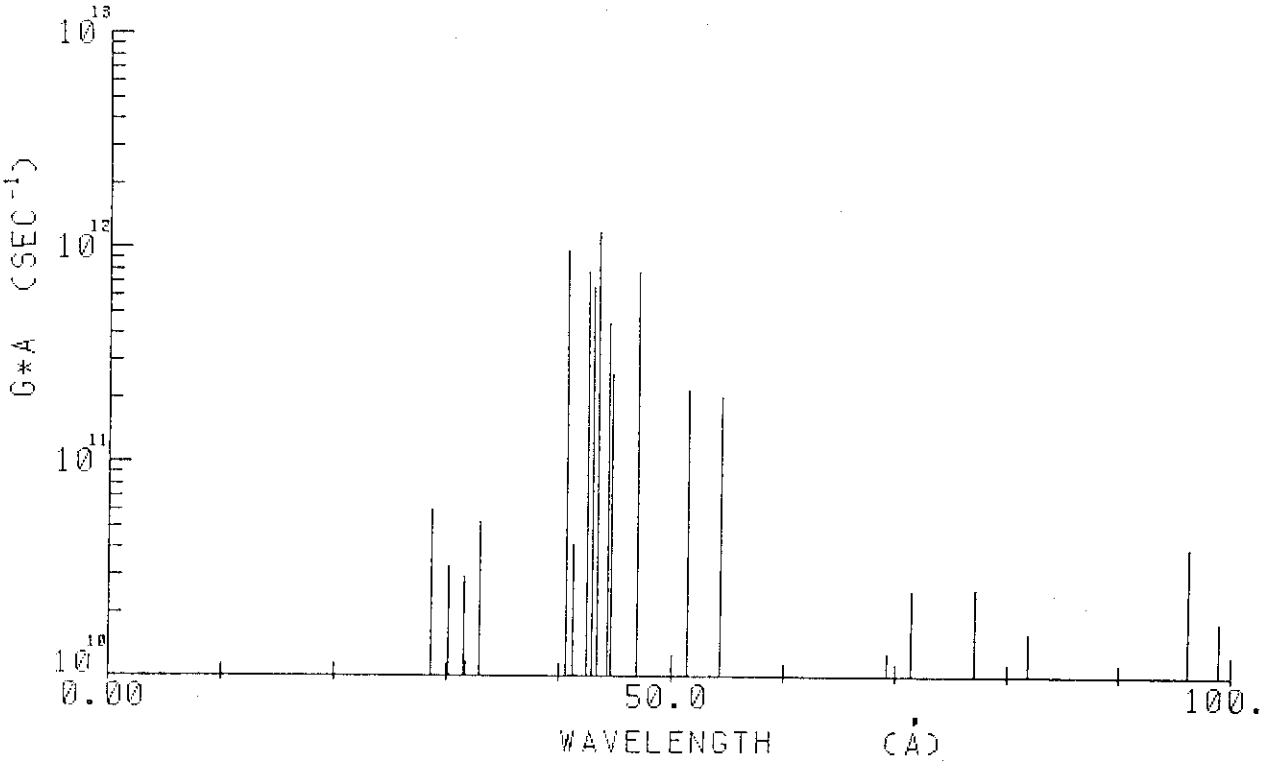
Mo XXXVII　エネルギーレベル　n＝3

ODD　1　$(2s)^2\ (2p)\ (3s)$

2　$(2s)^2\ (2p)\ (3d)$

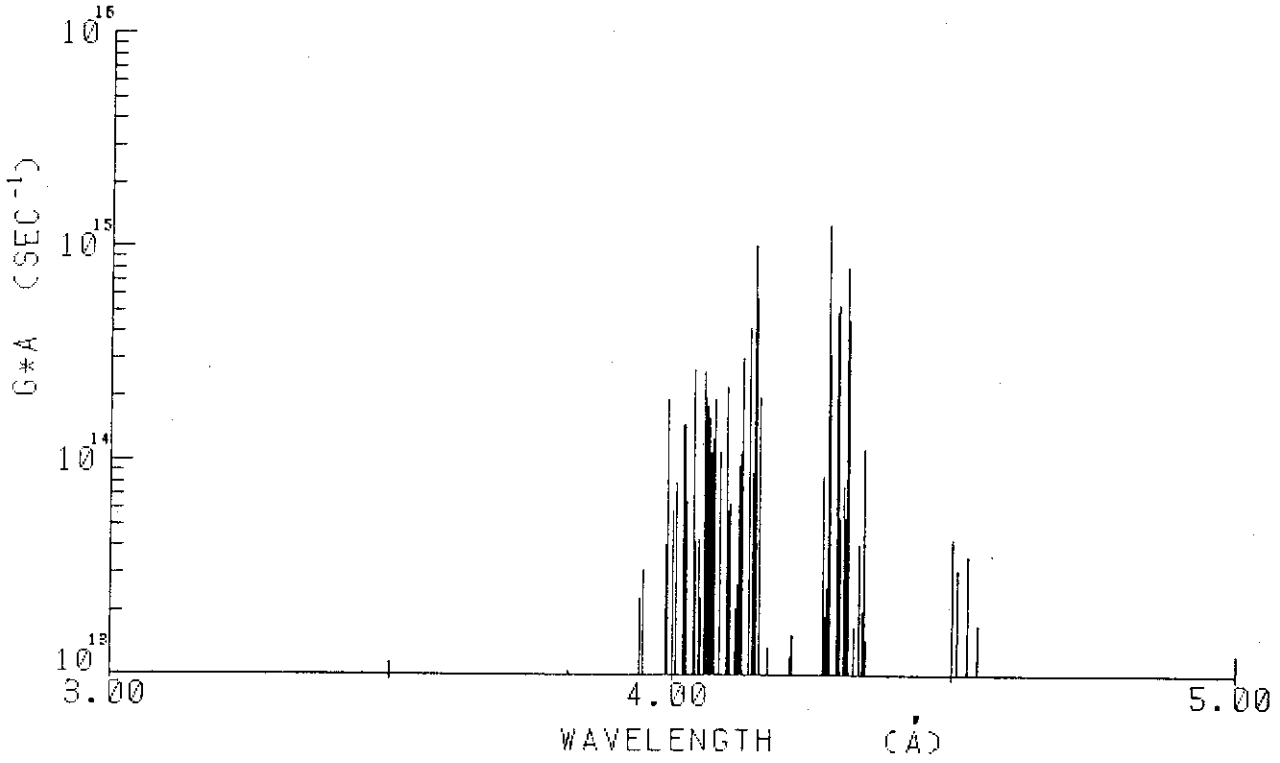
3　$(2s)\ (2p)^2\ (3p)$

ODD J	PARITY NO	ENERGY(KK)		LEADING PERCENTAGES	
0.0	1	23021.742	---	1 (0.5, 0.5) 98.3%	
0.0	2	24237.160	---	3 (3P) 5D 61.7%	3 (1S) 3P 21.0%
0.0	3	25091.102	---	2(1.5, 1.5) 97.5%	
0.0	4	25430.270	---	3 (3P) 3P 65.0%	3 (3P) 5D 22.5%
0.0	5	25550.676	---	3 (3P) 3P 46.6%	3 (3P) 1S 21.6%
0.0	6	25897.344	---	3 (1D) 3P 74.3%	3 (3P) 1S 13.1%
0.0	7	26673.363	---	3 (1S) 3P 68.2%	3 (3P) 1S 12.6%
0.0	8	26902.445	---	3 (3P) 1S 39.2%	3 (3P) 3P 29.8%
1.0	1	23041.348	---	1(0.5, 0.5) 98.4%	
1.0	2	24078.551	---	1(1.5, 0.5) 95.9%	
1.0	3	24096.020	---	2(0.5, 1.5) 92.7%	
1.0	4	24255.312	---	3 (3P) 5D 32.6%	3 (1S) 3P 14.7%
1.0	5	24611.164	---	3 (3P) 3D 39.9%	3 (1S) 1P 16.3%
1.0	6	24978.445	---	3 (3P) 5P 40.2%	3 (3P) 5D 30.4%
1.0	7	25091.480	---	2(1.5, 1.5) 94.8%	
1.0	8	25252.832	---	2(1.5, 2.5) 94.3%	
1.0	9	25318.500	---	3 (3P) 5P 32.3%	3 (3P) 3D 23.4%
1.0	10	25522.945	---	3 (3P) 3D 41.0%	3 (1D) 3D 25.8%
1.0	11	25588.582	---	3 (1D) 1P 37.1%	3 (3P) 3P 30.5%
1.0	12	25695.645	---	3 (1D) 3D 22.2%	3 (3P) 1P 13.8%
1.0	13	25892.437	---	3 (3P) 3S 23.2%	3 (1D) 3P 21.6%
1.0	14	25938.973	---	3 (1D) 3P 22.9%	3 (3P) 3P 21.8%
1.0	16	26506.766	---	3 (1D) 1P 35.0%	3 (1D) 3P 20.9%
1.0	17	26694.883	---	3 (3P) 3D 18.9%	3 (1S) 3P 18.6%
1.0	18	26700.758	---	3 (1S) 3P 25.2%	3 (3P) 3S 21.0%
1.0	19	26933.852	---	3 (1S) 1P 42.3%	3 (1S) 3P 23.3%
1.0	20	27065.672	---	3 (3P) 1P 27.3%	2 (4S) 3S 21.0%
2.0	1	23979.035	---	2(0.5, 1.5) 97.7%	
2.0	2	24032.004	---	1(1.5, 0.5) 87.4%	2(0.5, 2.5) 8.8%
2.0	3	24135.680	---	2(0.5, 2.5) 87.4%	
2.0	4	24572.969	---	3 (3P) 5P 29.0%	3 (3P) 5D 27.8%
2.0	5	25021.918	---	2(1.5, 1.5) 58.2%	3(.5,3P1,.5) 25.8%
2.0	6	25050.176	---	3 (3P) 5D 32.1%	4 (2P) 1D 16.7%
2.0	7	25136.098	---	2(1.5, 2.5) 82.6%	2(1.5, 1.5) 13.9%
2.0	8	25324.113	---	3 (3P) 5S 33.1%	3 (1D) 3P 17.5%
2.0	9	25380.992	---	3 (3P) 3D 49.5%	3 (3P) 5P 20.2%
2.0	10	25517.574	---	3 (1D) 3F 44.3%	3 (1D) 1D 24.4%
2.0	11	25535.184	---	3 (3P) 3P 31.5%	3 (1D) 3P 22.8%
2.0	12	25828.270	---	3 (3P) 3P 26.1%	3 (1D) 3D 20.5%
2.0	13	25902.785	---	3 (3P) 3D 25.6%	3 (3P) 1D 23.5%
2.0	15	26244.000	---	3 (1D) 3P 26.1%	3 (1D) 3D 21.0%
2.0	16	26614.512	---	3 (3P) 3P 25.9%	3 (1D) 1D 23.2%
2.0	17	26719.621	---	3 (3P) 3D 32.8%	3 (3P) 1D 24.8%
2.0	18	26924.164	---	3 (1S) 3P 55.7%	3 (3P) 3P 23.6%
2.0	19	26993.309	---	3 (3P) 1D 34.1%	3 (3P) 3P 25.3%
3.0	1	24143.703	---	2(0.5, 2.5) 98.0%	
3.0	2	25067.738	---	2(1.5, 1.5) 75.0%	2(1.5, 2.5) 18.0%
3.0	3	25207.359	---	3 (3P) 5D 23.3%	3 (1D) 3F 15.6%
3.0	4	25231.895	---	2(1.5, 2.5) 54.6%	3(.5,3P2,.5) 8.5%
3.0	5	25279.809	---	3 (3P) 5P 40.5%	3 (3P) 5D 36.5%
3.0	6	25599.965	---	3 (3P) 3D 25.6%	3 (1D) 1F 24.2%
3.0	7	25836.348	---	3 (1D) 3F 47.9%	3 (3P) 3D 24.5%
3.0	8	26277.406	---	3 (3P) 3D 27.9%	3 (1D) 3D 21.3%
3.0	9	26455.582	---	3 (1D) 3D 36.5%	3 (3P) 5P 23.2%
3.0	10	26902.094	---	3 (3P) 3D 66.5%	3 (1D) 3F 11.9%
4.0	1	25072.922	---	2(1.5, 2.5) 98.5%	
4.0	2	25483.402	---	3 (3P) 5D 57.5%	3 (1D) 3F 41.3%
4.0	3	26460.109	---	3 (1D) 3F 57.5%	3 (3P) 5D 42.1%



Mo XXXVII　スペクトル・パターン

$(2s)^2\ (2p)^2 - (2s)\ (2p)^3$



Mo XXXVII　スペクトル・パターン

$(2s)^2\ (2p)^2 - (2s)^2\ (2p)\ (3s)$

$(2s)^2\ (2p)\ (3d)$

$(2s)\ (2p)^2\ (3p)$

Mo XXXVII　波長，振動子強度

$(2s)^2\ (2p)^2 - (2s)\ (2p)^3$

$(2s)^2\ (2p)\ (3s)$

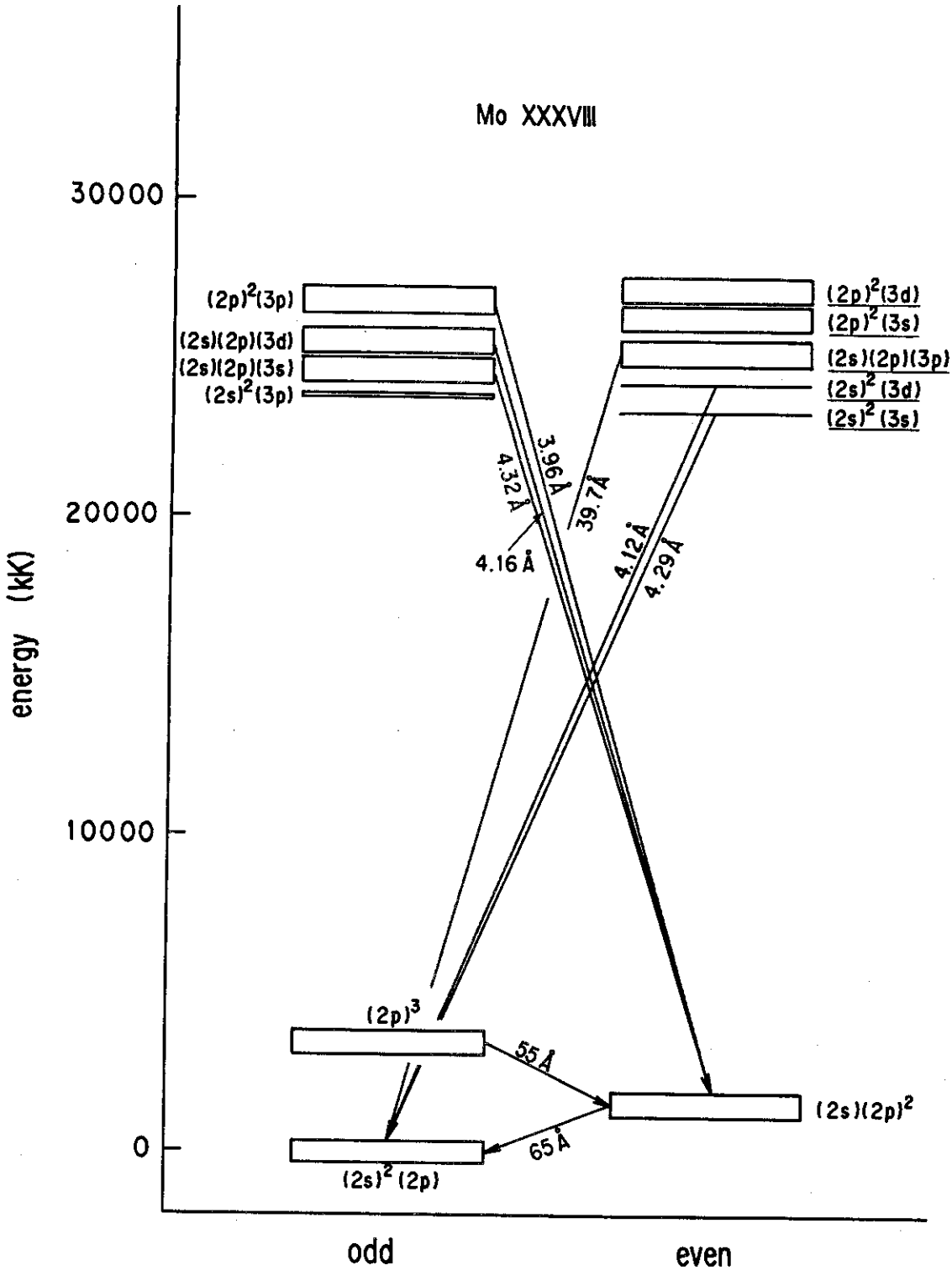
$(2s)^2\ (2p)\ (3d)$

$(2s)\ (2p)^2\ (3p)$

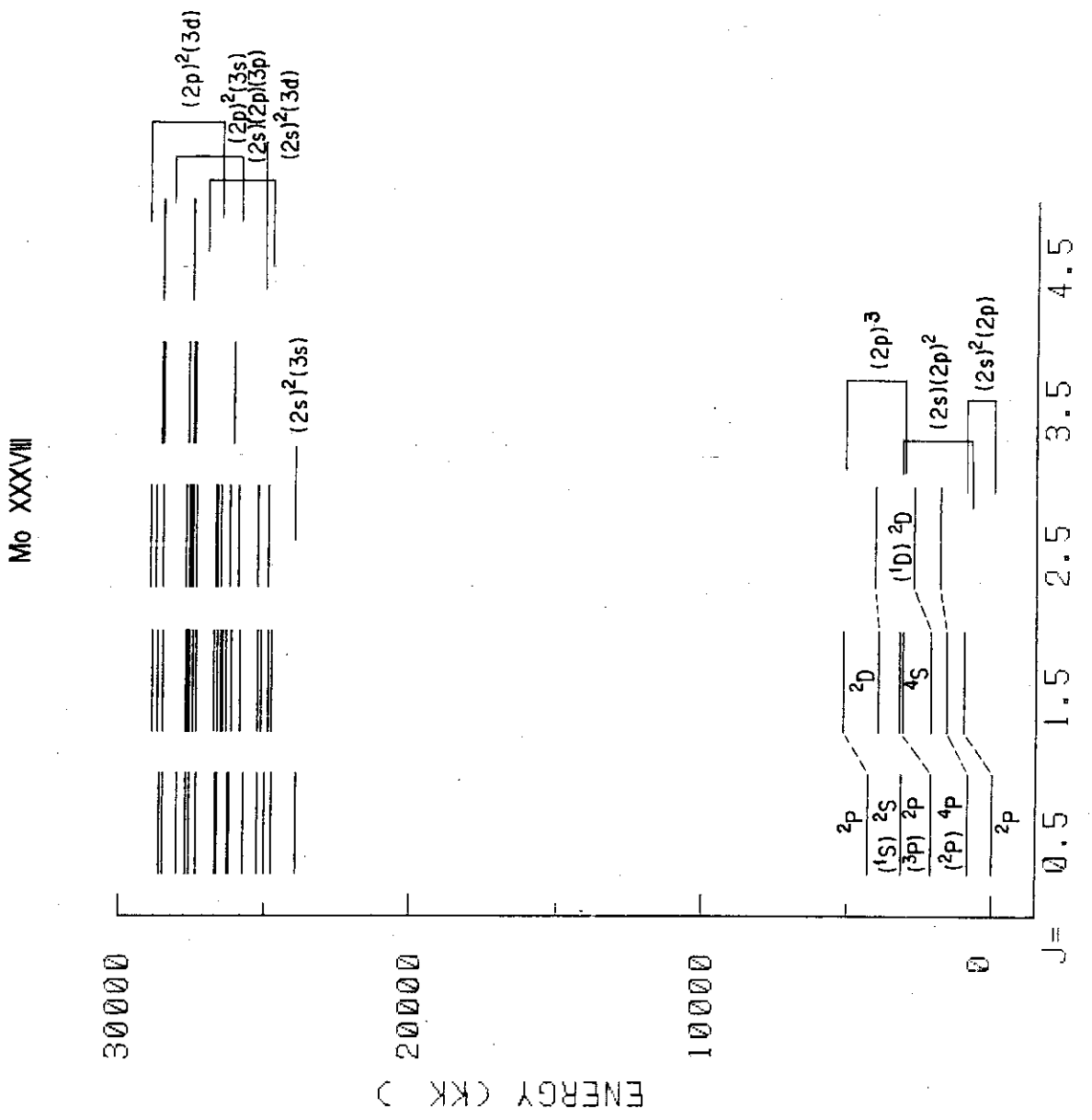
NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
1	2082.010	0.0	2251.650	1.0	589.483	0.0002	0.4406E+07
2	1860.778	2.0	2251.650	1.0	255.838	0.0011	0.1171E+09
3	1860.778	2.0	2679.707	2.0	122.111	0.0031	0.1398E+10
4	956.048	2.0	1852.616	2.0	111.536	0.0161	0.8659E+10
5	842.142	1.0	1852.616	2.0	98.963	0.0267	0.1820E+11
6	1860.778	2.0	2899.731	3.0	96.251	0.0559	0.4022E+11
7	2082.010	0.0	3166.954	1.0	92.171	0.0038	0.2957E+10
8	2082.010	0.0	3303.295	1.0	81.881	0.0161	0.1600E+11
9	956.048	2.0	2251.650	1.0	77.184	0.0231	0.2585E+11
10	1860.778	2.0	3166.954	1.0	76.559	0.0049	0.5601E+10
11	1860.778	2.0	3259.707	2.0	71.483	0.0195	0.2549E+11
12	842.142	1.0	2251.650	1.0	70.947	0.0031	0.4112E+10
13	1860.778	2.0	3303.295	1.0	69.323	0.0092	0.1278E+11
14	956.048	2.0	2679.707	2.0	58.016	0.0041	0.8176E+10
15	842.142	1.0	2679.707	2.0	54.420	0.0903	0.2034E+12
16	956.048	2.0	2899.731	3.0	51.449	0.0866	0.2182E+12
17	1860.778	2.0	3986.198	2.0	47.050	0.2611	0.7866E+12
18	2082.010	0.0	4322.492	1.0	44.633	0.0770	0.2577E+12
19	842.142	1.0	3082.716	0.0	44.631	0.0431	0.1443E+12
20	0.004	0.0	2251.650	1.0	44.412	0.1325	0.4481E+12
21	956.048	2.0	3259.707	2.0	43.409	0.3364	0.1191E+13
22	842.142	1.0	3166.954	1.0	43.014	0.1823	0.6571E+12
23	956.048	2.0	3303.295	1.0	42.603	0.2114	0.7767E+12
24	842.142	1.0	3259.707	2.0	41.364	0.0106	0.4135E+11
25	842.142	1.0	3303.295	1.0	40.631	0.0265	0.1073E+12
26	1860.778	2.0	4322.492	1.0	40.622	0.2402	0.9708E+12
27	956.048	2.0	3986.198	2.0	33.002	0.0087	0.5313E+11
28	842.142	1.0	3986.198	2.0	31.806	0.0018	0.1159E+11
29	0.004	0.0	3166.954	1.0	31.576	0.0044	0.2936E+11
30	0.004	0.0	3303.295	1.0	30.273	0.0045	0.3292E+11
31	956.048	2.0	4322.492	1.0	29.705	0.0012	0.8939E+10
32	842.142	1.0	4322.492	1.0	28.733	0.0074	0.5997E+11
33	2082.010	0.0	24078.543	1.0	4.546	0.0534	0.1722E+14
34	956.048	2.0	23041.344	1.0	4.528	0.1105	0.3596E+14
35	1860.778	2.0	24032.000	2.0	4.510	0.0949	0.3113E+14
36	842.142	1.0	23021.727	0.0	4.509	0.0475	0.1557E+14
37	842.142	1.0	23041.344	1.0	4.505	0.0233	0.7656E+13
38	1860.778	2.0	24078.543	1.0	4.501	0.1315	0.4330E+14
39	1860.778	2.0	24135.660	2.0	4.489	0.0278	0.9213E+13
40	2082.010	0.0	25091.469	1.0	4.346	0.0410	0.1449E+14
41	956.048	2.0	23979.023	2.0	4.343	0.3247	0.1148E+15
42	0.004	0.0	23041.344	1.0	4.340	0.0565	0.2001E+14
43	956.048	2.0	24032.000	2.0	4.334	0.1149	0.4079E+14
44	956.048	2.0	24078.543	1.0	4.325	0.0478	0.1705E+14
45	956.048	2.0	24096.016	1.0	4.322	0.0196	0.7012E+13
46	842.142	1.0	23979.023	2.0	4.322	0.0115	0.4114E+13
47	2082.010	0.0	25252.828	1.0	4.316	1.2666	0.4535E+15
48	956.048	2.0	24135.660	2.0	4.314	0.1274	0.4567E+14
49	956.048	2.0	24143.695	3.0	4.313	2.2650	0.8123E+15
50	842.142	1.0	24032.000	2.0	4.312	0.3853	0.1382E+15

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
51	1860.778	2.0	25067.727	3.0	4.309	0.1503	0.5400E+14
52	1860.778	2.0	25091.469	1.0	4.305	0.2119	0.7628E+14
53	2082.010	0.0	25318.492	1.0	4.304	0.0104	0.3759E+13
54	842.142	1.0	24078.543	1.0	4.304	0.0174	0.6276E+13
55	842.142	1.0	24096.016	1.0	4.300	0.1504	0.5425E+14
56	1860.778	2.0	25136.094	2.0	4.296	1.4924	0.5393E+15
57	842.142	1.0	24135.660	2.0	4.293	1.3726	0.4967E+15
58	1860.778	2.0	25207.344	3.0	4.283	0.8682	0.3156E+15
59	1860.778	2.0	25231.887	3.0	4.279	3.4912	0.1272E+16
60	1860.778	2.0	25252.828	1.0	4.275	0.0711	0.2595E+14
61	842.142	1.0	24255.309	1.0	4.271	0.0512	0.1871E+14
62	1860.778	2.0	25279.805	3.0	4.270	0.2346	0.8582E+14
63	1860.778	2.0	25380.988	2.0	4.252	0.0102	0.3778E+13
64	1860.778	2.0	25517.566	2.0	4.227	0.0113	0.4223E+13
65	1860.778	2.0	25522.941	1.0	4.226	0.0149	0.5553E+13
66	1860.778	2.0	25535.168	2.0	4.224	0.0253	0.9441E+13
67	842.142	1.0	24572.957	2.0	4.214	0.0412	0.1548E+14
68	1860.778	2.0	25599.949	3.0	4.212	0.0327	0.1228E+14
69	1860.778	2.0	25828.254	2.0	4.172	0.0133	0.5108E+13
70	1860.778	2.0	25836.336	3.0	4.171	0.0355	0.1361E+14
71	956.048	2.0	24978.430	1.0	4.163	0.0141	0.5439E+13
72	956.048	2.0	25021.902	2.0	4.155	0.5210	0.2013E+15
73	0.004	0.0	24078.543	1.0	4.153	0.0127	0.4894E+13
74	0.004	0.0	24096.016	1.0	4.150	1.5074	0.5838E+15
75	956.048	2.0	25050.156	2.0	4.150	0.2459	0.9522E+14
76	956.048	2.0	25067.727	3.0	4.147	2.6750	0.1037E+16
77	842.142	1.0	24978.430	1.0	4.143	0.1092	0.4244E+14
78	956.048	2.0	25091.469	1.0	4.143	0.2284	0.8875E+14
79	956.048	2.0	25136.094	2.0	4.136	0.2257	0.8801E+14
80	842.142	1.0	25021.902	2.0	4.136	1.0959	0.4273E+15
81	842.142	1.0	25091.469	1.0	4.124	0.7753	0.3041E+15
82	842.142	1.0	25091.086	0.0	4.124	0.3446	0.1352E+15
83	0.004	0.0	24255.309	1.0	4.123	0.0141	0.5550E+13
84	956.048	2.0	25207.344	3.0	4.123	0.2756	0.1081E+15
85	956.048	2.0	25231.887	3.0	4.119	0.2409	0.9467E+14
86	842.142	1.0	25136.094	2.0	4.116	0.0679	0.2674E+14
87	956.048	2.0	25279.805	3.0	4.111	0.0527	0.2079E+14
88	956.048	2.0	25324.109	2.0	4.104	0.1617	0.6404E+14
89	1860.778	2.0	26244.000	2.0	4.101	0.1501	0.5952E+14
90	842.142	1.0	25252.828	1.0	4.097	0.0272	0.1083E+14
91	1860.778	2.0	26277.391	3.0	4.096	0.5588	0.2222E+15
92	956.048	2.0	25380.988	2.0	4.094	0.0142	0.5669E+13
93	842.142	1.0	25318.492	1.0	4.086	0.2769	0.1106E+15
94	842.142	1.0	25324.109	2.0	4.085	0.0292	0.1166E+14
95	842.142	1.0	25380.988	2.0	4.075	0.4895	0.1966E+15
96	956.048	2.0	25517.566	2.0	4.071	0.3178	0.1279E+15
97	956.048	2.0	25535.168	2.0	4.068	0.2739	0.1104E+15
98	842.142	1.0	25430.254	0.0	4.067	0.0992	0.3999E+14
99	1860.778	2.0	26455.566	3.0	4.066	0.3971	0.1602E+15
100	2082.010	0.0	26694.879	1.0	4.063	0.1180	0.4770E+14

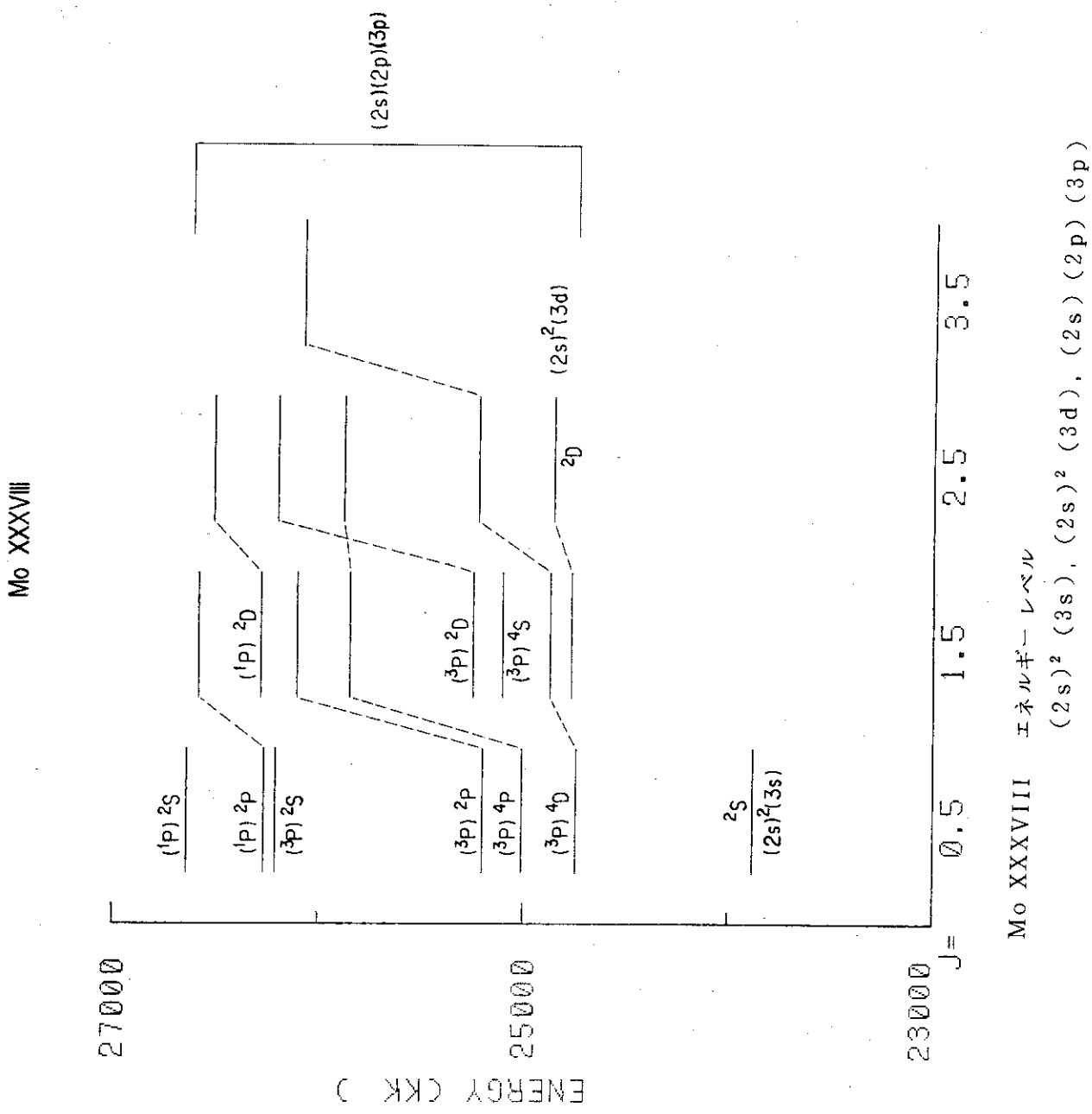
NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
101	0.004	0.0	24611.148	1.0	4.063	0.4533	0.1831E+15
102	2082.010	0.0	26700.750	1.0	4.062	0.0976	0.3945E+14
103	956.048	2.0	25588.574	1.0	4.060	0.4973	0.2012E+15
104	956.048	2.0	25599.949	3.0	4.058	0.6470	0.2621E+15
105	1860.778	2.0	26506.750	1.0	4.057	0.3514	0.1424E+15
106	842.142	1.0	25517.566	2.0	4.053	0.0188	0.7633E+13
107	842.142	1.0	25522.941	1.0	4.052	0.0573	0.2329E+14
108	842.142	1.0	25535.168	2.0	4.050	0.0389	0.1583E+14
109	842.142	1.0	25550.672	0.0	4.047	0.1056	0.4302E+14
110	956.048	2.0	25695.629	1.0	4.042	0.1038	0.4237E+14
111	842.142	1.0	25588.574	1.0	4.041	0.0462	0.1888E+14
112	1860.778	2.0	26614.492	2.0	4.040	0.6560	0.2681E+15
113	1860.778	2.0	26694.879	1.0	4.027	0.0487	0.2002E+14
114	1860.778	2.0	26700.750	1.0	4.026	0.1562	0.6429E+14
115	842.142	1.0	25695.629	1.0	4.024	0.0326	0.1343E+14
116	2082.010	0.0	26933.840	1.0	4.024	0.3606	0.1486E+15
117	1860.778	2.0	26719.613	2.0	4.023	0.1896	0.7816E+14
118	956.048	2.0	25828.254	2.0	4.021	0.0958	0.3954E+14
119	956.048	2.0	25836.336	3.0	4.019	0.3578	0.1477E+15
120	956.048	2.0	25902.781	2.0	4.009	0.1900	0.7887E+14
121	2082.010	0.0	27065.660	1.0	4.003	0.0251	0.1044E+14
122	842.142	1.0	25828.254	2.0	4.002	0.1423	0.5926E+14
123	1860.778	2.0	26902.078	3.0	3.993	0.4700	0.1966E+15
124	842.142	1.0	25892.430	1.0	3.992	0.1429	0.5983E+14
125	1860.778	2.0	26924.156	2.0	3.990	0.0543	0.2274E+14
126	842.142	1.0	25902.781	2.0	3.990	0.0979	0.4103E+14
127	1860.778	2.0	27065.437	2.0	3.968	0.0188	0.7951E+13
128	1860.778	2.0	27065.660	1.0	3.967	0.0224	0.9495E+13
129	956.048	2.0	26234.352	2.0	3.956	0.0134	0.5710E+13
130	1860.778	2.0	27176.957	1.0	3.950	0.0726	0.3103E+14
131	1860.778	2.0	27226.109	3.0	3.942	0.0536	0.2299E+14
132	842.142	1.0	26234.352	2.0	3.938	0.0115	0.4924E+13
133	2082.010	0.0	27474.016	1.0	3.938	0.0127	0.5447E+13
134	956.048	2.0	26455.566	3.0	3.922	0.0131	0.5691E+13
135	956.048	2.0	26506.750	1.0	3.914	0.0196	0.8518E+13
136	956.048	2.0	26902.078	3.0	3.854	0.0115	0.5147E+13
137	842.142	1.0	26924.156	2.0	3.834	0.0150	0.6801E+13
138	956.048	2.0	27145.695	3.0	3.818	0.0230	0.1051E+14
139	1860.778	2.0	28204.477	3.0	3.796	0.0180	0.8320E+13
140	956.048	2.0	28362.000	3.0	3.649	0.0138	0.6918E+13
141	1860.778	2.0	29351.184	3.0	3.638	0.0118	0.5966E+13



Mo XXXVIII　グロトリアン・ダイアグラム



Mo XXXVIII エネルギーレベル



Mo XXVIII エネルギーレベル
$(2s)^2(3s)$, $(2s)^2(3d)$, $(2s)(2p)(3p)$

Mo XXXVIII　エネルギー レベル

ODD　1　$(2s)^2\ (2p)$

　　2　$(2p)^3$

EVEN　1　$(2s)\ (2p)^2$

ODD PARITY J	NO	ENERGY(KK)		LEADING PERCENTAGES					
0.5	1	0.000	---	1	2P	99.2%			
0.5	2	4273.668	---	2	2P	99.2%			
1.5	1	972.276	---	1	2P	98.1%	2	2P	1.7%
1.5	2	3111.488	---	2	2P	38.7%	2	4S	37.0%
1.5	3	3907.776	---	2	2D	49.0%	2	4S	49.0%
1.5	4	5100.801	---	2	2P	57.7%	2	2D	27.9%
2.5	1	4053.989	---	2	2D	100.0%			

EVEN PARITY J	NO	ENERGY(KK)		LEADING PERCENTAGES					
0.5	1	879.860	---	1 (3P)	4P	72.1%	1 (1S)	2S	20.6%
0.5	2	2153.426	---	1 (3P)	2P	73.2%	1 (3P)	4P	18.3%
0.5	3	3168.603	---	1 (1S)	2S	71.0%	1 (3P)	2P	19.5%
1.5	1	1593.779	---	1 (3P)	4P	95.3%	1 (1D)	2D	3.2%
1.5	2	2116.839	---	1 (1D)	2D	75.1%	1 (3P)	2P	24.0%
1.5	3	3194.445	---	1 (3P)	2P	74.5%	1 (1D)	2D	21.7%
2.5	1	1802.207	---	1 (3P)	4P	57.0%	1 (1D)	2D	43.0%
2.5	2	2735.918	---	1 (1D)	2D	57.0%	1 (3P)	4P	43.0%

Mo XXXVIII　エネルギー レベル

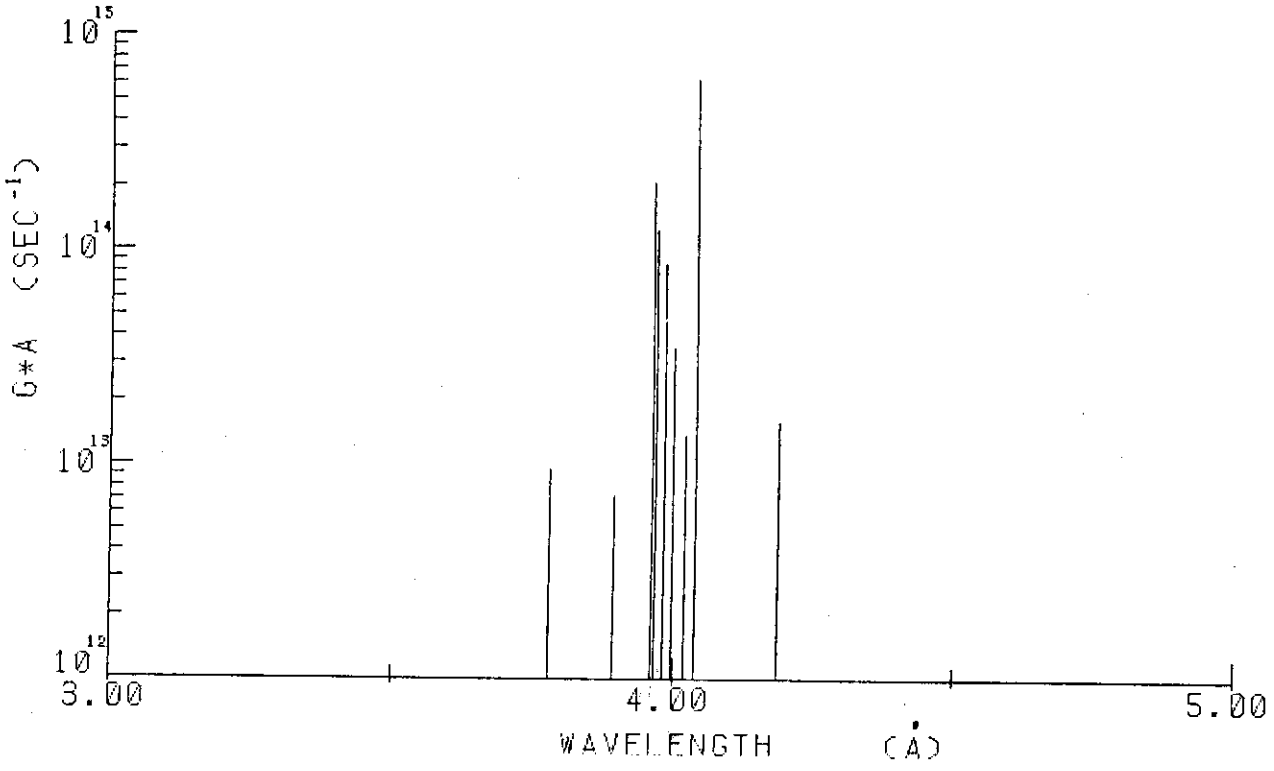
EVEN 1 $(2s)^2$ $(3s)$
2 $(2p)^2$ $(3s)$
3 $(2s)$ $(2p)$ $(3p)$
4 $(2s)^2$ $(3d)$
5 $(2p)^2$ $(3d)$

EVEN PARITY

J	NO	ENERGY(KK)		LEADING PERCENTAGES	
0.5	1	23886.777	---	1 2S 96.2%	2 (1S) 2S 2.3%
0.5	2	24751.465	---	3 (3P) 4D 73.1%	3 (3P) 2P 20.1%
0.5	3	25014.047	---	3 (3P) 4P 57.9%	3 (3P) 2S 20.4%
0.5	4	25203.191	---	3 (3P) 2P 41.8%	3 (3P) 4P 15.4%
0.5	5	25687.211	---	2 (3P) 4P 52.8%	2 (1S) 2S 20.4%
0.5	6	26213.367	---	3 (3P) 2S 47.0%	3 (3P) 2P 24.8%
0.5	7	26270.914	---	3 (1P) 2P 55.5%	3 (1P) 2S 22.5%
0.5	8	26598.266	---	2 (3P) 2P 43.1%	3 (1P) 2S 23.3%
0.5	9	26645.898	---	3 (1P) 2S 34.8%	2 (3P) 2P 19.7%
0.5	10	27331.676	---	5 (3P) 4D 80.8%	5 (3P) 2P 13.6%
0.5	11	27568.629	---	5 (3P) 4P 45.6%	5 (1D) 2S 29.2%
0.5	12	27673.699	---	5 (3P) 2P 42.5%	5 (1D) 2P 28.0%
0.5	13	27976.090	---	2 (1S) 2S 73.4%	2 (3P) 4P 14.3%
0.5	14	28497.070	---	5 (1D) 2P 46.5%	5 (3P) 2P 22.1%
0.5	15	28607.199	---	5 (1D) 2S 47.0%	5 (3P) 4P 31.8%
1.5	1	24770.094	---	4 2D 90.8%	3 (3P) 4D 2.8%
1.5	2	24875.387	---	3 (3P) 4D 49.1%	3 (3P) 2P 18.7%
1.5	3	25105.719	---	3 (3P) 4P 29.9%	3 (3P) 4D 23.8%
1.5	4	25254.328	---	3 (3P) 2D 45.0%	3 (3P) 4S 18.8%
1.5	5	25854.781	---	3 (3P) 4P 49.0%	3 (3P) 4S 21.4%
1.5	6	26111.883	---	3 (3P) 2P 49.0%	3 (3P) 4S 32.6%
1.5	7	26282.516	---	3 (1P) 2D 61.2%	3 (1P) 2P 18.2%
1.5	8	26446.137	---	5 (3P) 4F 38.2%	5 (1S) 2D 21.3%
1.5	9	26513.961	---	2 (3P) 4P 61.5%	2 (3P) 2P 11.8%
1.5	10	26585.914	---	3 (1P) 2P 37.2%	2 (3P) 4P 26.7%
1.5	11	26728.207	---	2 (1D) 2D 46.7%	2 (3P) 2P 29.4%
1.5	12	27315.242	---	5 (3P) 4F 41.9%	5 (3P) 2P 31.3%
1.5	13	27468.668	---	5 (3P) 4D 40.8%	5 (3P) 2P 26.6%
1.5	14	27551.102	---	5 (3P) 4P 44.7%	5 (1D) 2P 27.3%
1.5	15	27654.301	---	5 (3P) 2D 41.5%	5 (1D) 2P 23.5%
1.5	16	27706.004	---	2 (3P) 2P 49.2%	2 (1D) 2D 35.9%
1.5	17	28487.160	---	5 (1D) 2D 34.1%	5 (3P) 4P 20.8%
1.5	18	28666.480	---	5 (1D) 2P 35.2%	5 (3P) 2P 21.3%
1.5	19	28850.422	---	5 (1S) 2D 66.1%	5 (3P) 2D 16.9%
2.5	1	24861.590	---	4 2D 96.1%	5 (1S) 2D 2.3%
2.5	2	25226.117	---	3 (3P) 4D 58.4%	3 (3P) 4P 17.4%
2.5	3	25882.461	---	3 (3P) 2D 40.2%	3 (3P) 4D 29.9%
2.5	4	26200.156	---	3 (3P) 2D 49.1%	3 (3P) 4P 43.9%
2.5	5	26512.184	---	3 (1P) 2D 67.9%	2 (1D) 2D 10.4%
2.5	6	26584.457	---	5 (3P) 4D 20.5%	5 (1S) 2D 19.8%
2.5	7	26692.355	---	2 (1D) 2D 39.3%	2 (3P) 4P 34.9%
2.5	8	27332.180	---	5 (3P) 4F 54.6%	5 (1D) 2F 19.0%
2.5	9	27455.836	---	5 (3P) 4P 42.5%	5 (3P) 2F 21.5%
2.5	10	27539.621	---	5 (3P) 4D 38.2%	5 (1D) 2D 34.7%
2.5	11	27595.375	---	5 (3P) 2D 29.1%	2 (3P) 4P 18.6%
2.5	12	27679.285	---	2 (3P) 4P 35.8%	2 (1D) 2D 29.3%
2.5	13	28496.012	---	5 (3P) 4D 26.6%	5 (1D) 2D 24.4%
2.5	14	28696.406	---	5 (3P) 2D 41.0%	5 (1D) 2D 18.2%
2.5	15	28883.137	---	5 (1S) 2D 70.5%	5 (3P) 2F 11.5%

EVEN PARITY

J	NO	ENERGY(KK)		LEADING PERCENTAGES	
3.5	1	26083.941	---	3 (3P) 4D 99.7%	
3.5	2	27391.691	---	5 (3P) 4F 65.4%	5 (3P) 4D 24.3%
3.5	3	27429.410	---	5 (1D) 2G 28.1%	5 (3P) 4D 25.7%
3.5	4	27647.113	---	5 (1D) 2F 32.4%	5 (1D) 2G 27.7%
3.5	5	28490.309	---	5 (3P) 4D 39.9%	5 (1D) 2F 39.1%
3.5	6	28533.285	---	5 (3P) 2F 46.1%	5 (1D) 2G 34.3%
4.5	1	27513.687	---	5 (1D) 2G 55.0%	5 (3P) 4F 45.0%
4.5	2	28506.238	---	5 (3P) 4F 55.0%	5 (1D) 2G 45.0%



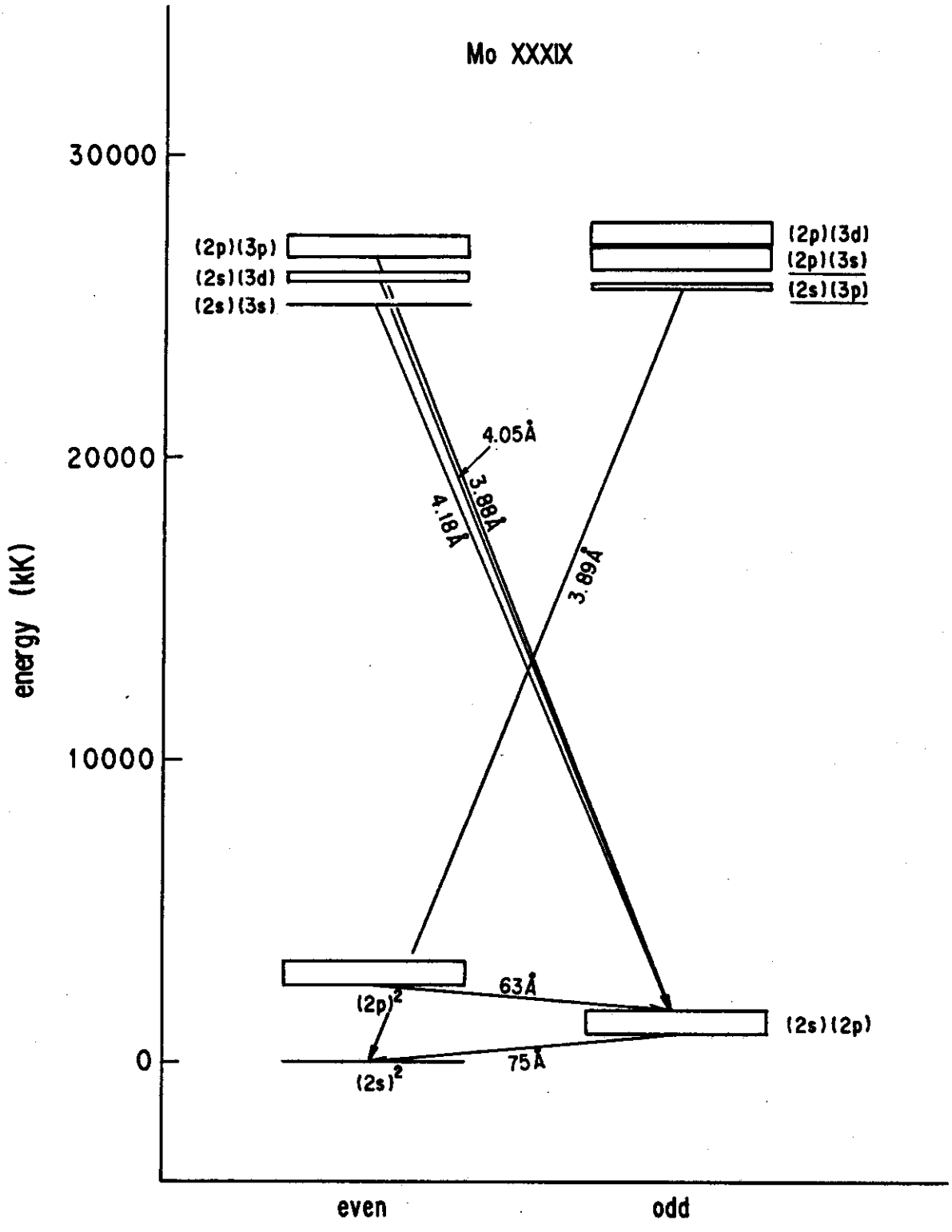
Mo XXXVIII　スペクトル・パターン

$(2s)^2\,(2p) - (2s)^2\,(3s)$
$(2s)^2\,(3d)$
$(2s)\,(2p)\,(3p)$

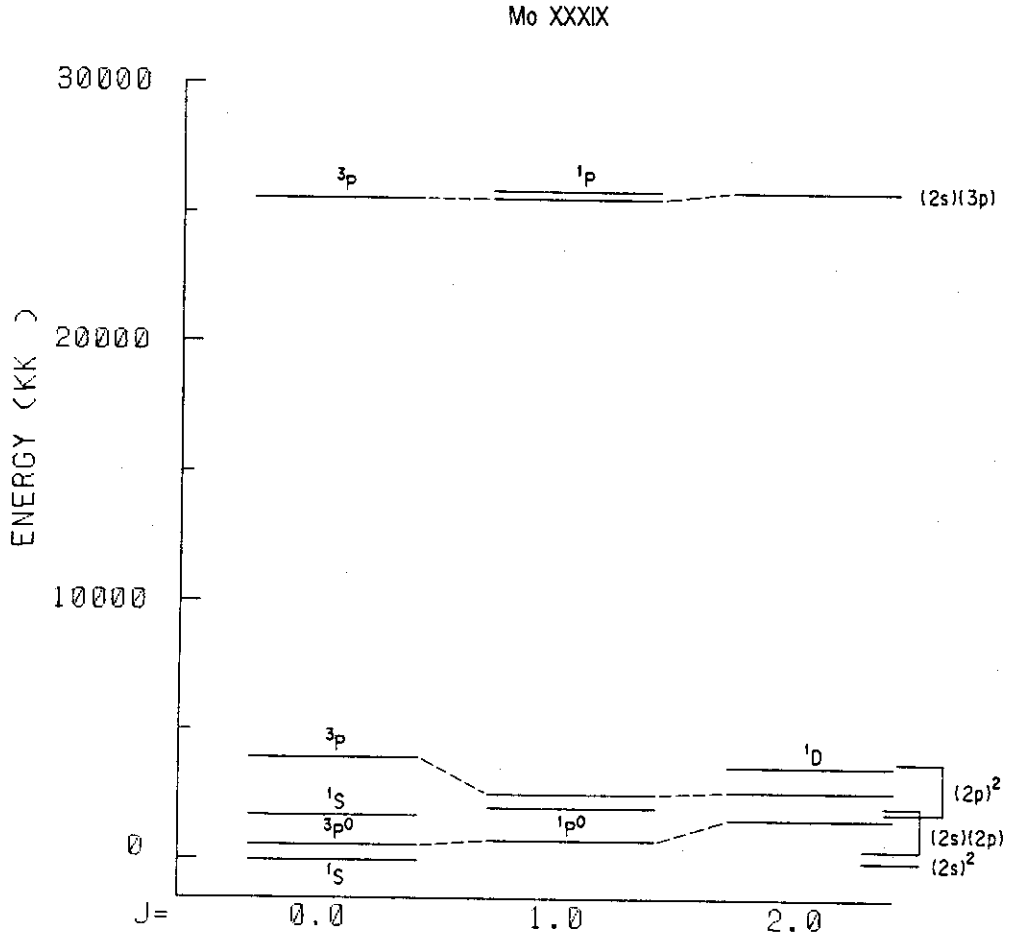
Mo XXXVIII　波長，振動子強度

$(2s)^2\,(2p) - (2s)\,(2p)^2$
$(2s)^2\,(3s)$
$(2s)^2\,(3d)$
$(2s)\,(2p)\,(3p)$

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
1	0.000	0.5	879.860	0.5	113.654	0.0125	0.6475E+10
2	0.000	0.5	1593.778	1.5	62.744	0.0005	0.9060E+09
3	0.000	0.5	2116.838	1.5	47.240	0.1599	0.4779E+12
4	0.000	0.5	2153.426	0.5	46.438	0.1255	0.3882E+12
5	0.000	0.5	3194.444	1.5	31.304	0.0064	0.4340E+11
6	0.000	0.5	23886.766	0.5	4.186	0.0418	0.1590E+14
7	0.000	0.5	24751.453	0.5	4.040	0.0689	0.2814E+14
8	0.000	0.5	24770.078	1.5	4.037	1.5626	0.6395E+15
9	0.000	0.5	24875.375	1.5	4.020	0.0334	0.1380E+14
10	0.000	0.5	25014.031	0.5	3.998	0.0841	0.3510E+14
11	0.000	0.5	25105.711	1.5	3.983	0.2055	0.8637E+14
12	0.000	0.5	25203.184	0.5	3.968	0.2950	0.1250E+15
13	0.000	0.5	25254.316	1.5	3.960	0.4920	0.2093E+15
14	0.000	0.5	25687.199	0.5	3.893	0.0165	0.7281E+13
15	0.000	0.5	26446.125	1.5	3.781	0.0204	0.9525E+13



Mo XXXIX　グロトリアン・ダイアグラム



Mo XXXIX　エネルギー レベル

$(2s)^2$, $(2s)(2p)$, $(2p)^2$, $(2s)(3p)$

Mo XXXIX エネルギー レベル

EVEN 1 $(2s)^2$

2 $(2p)^2$

ODD 1 (2s) (2p)

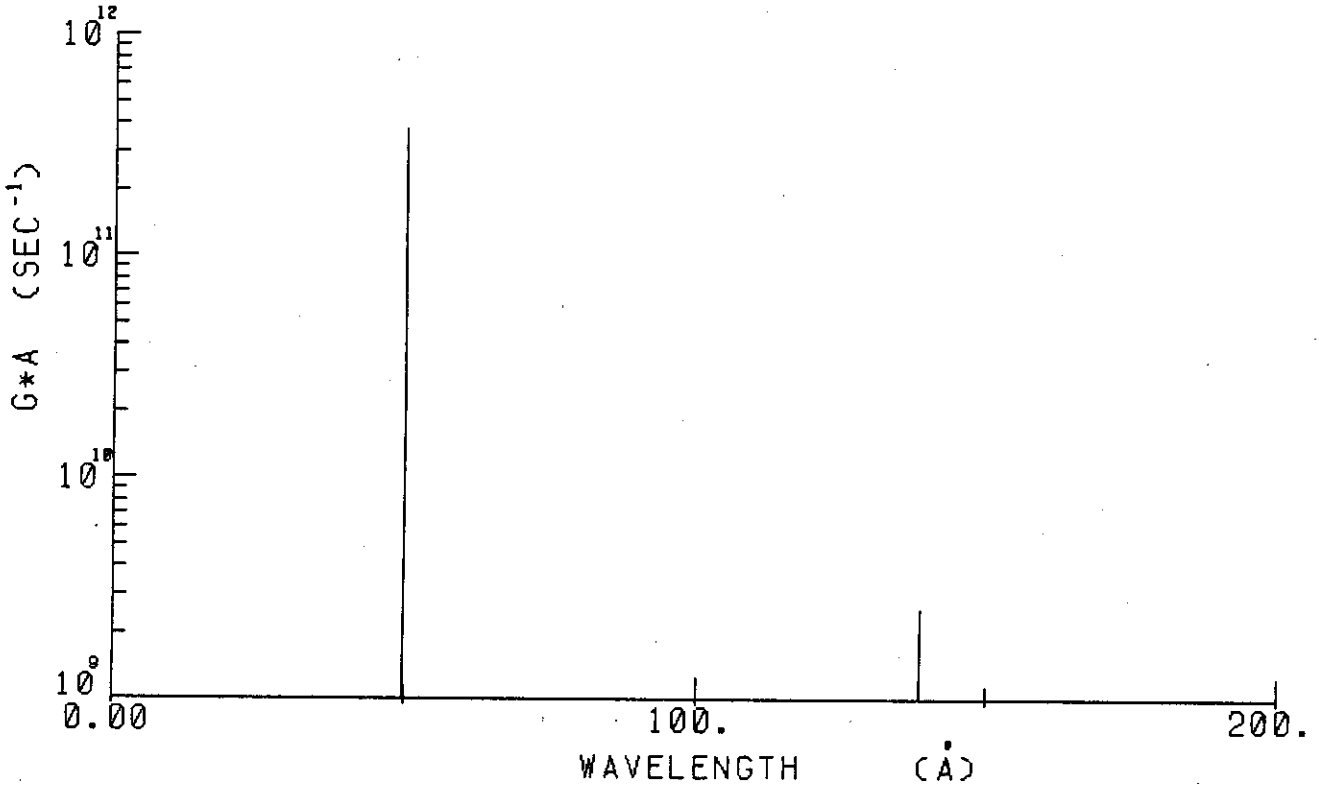
2 (2s) (3p)

EVEN PARITY

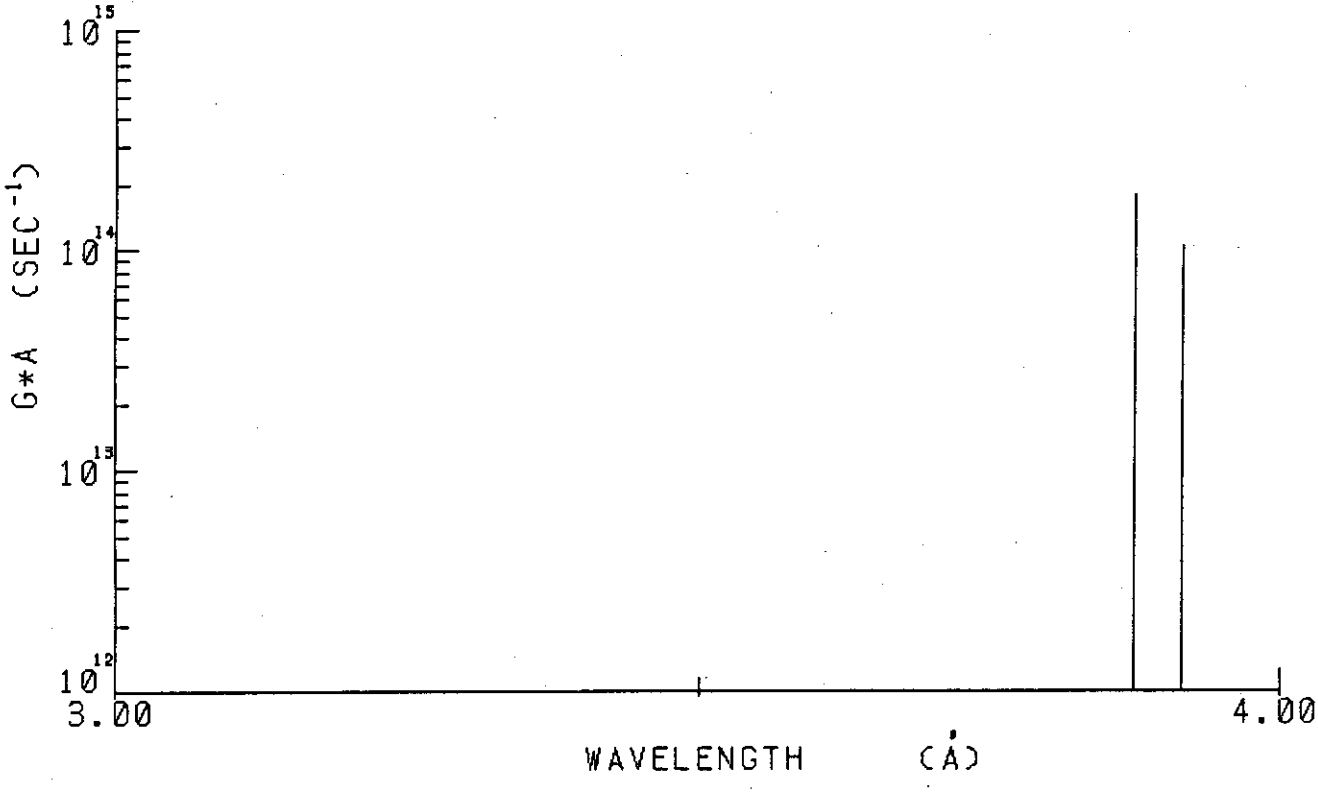
J	NO	ENERGY(KK)		LEADING PERCENTAGES			
0.0	1	-0.005	---	1	1S 97.1%	2	1S 2.5%
0.0	2	1732.351	---	2	3P 76.5%	2	1S 21.7%
0.0	3	3947.323	---	2	1S 75.8%	2	3P 23.0%
1.0	1	2568.758	---	2	3P100.0%		
2.0	1	2684.988	---	2	1D 57.7%	2	3P 42.3%
2.0	2	3640.263	---	2	3P 57.7%	2	1D 42.3%

ODD PARITY

J	NO	ENERGY(KK)		LEADING PERCENTAGES			
0.0	1	593.727	---	1	3P100.0%		
0.0	2	25529.824	---	2	3P 99.3%		
1.0	1	721.996	---	1	3P 84.0%	1	1P 16.0%
1.0	2	2015.777	---	1	1P 83.9%	1	3P 16.0%
1.0	3	25536.777	---	2	3P 67.8%	2	1P 30.8%
1.0	4	25810.566	---	2	1P 49.6%	2	3P 27.6%
2.0	1	1600.883	---	1	3P100.0%		
2.0	2	25838.070	---	2	3P 99.3%		



Mo XXXIX スペクトル・パターン
$(2s)^2-(2s)(2p)$



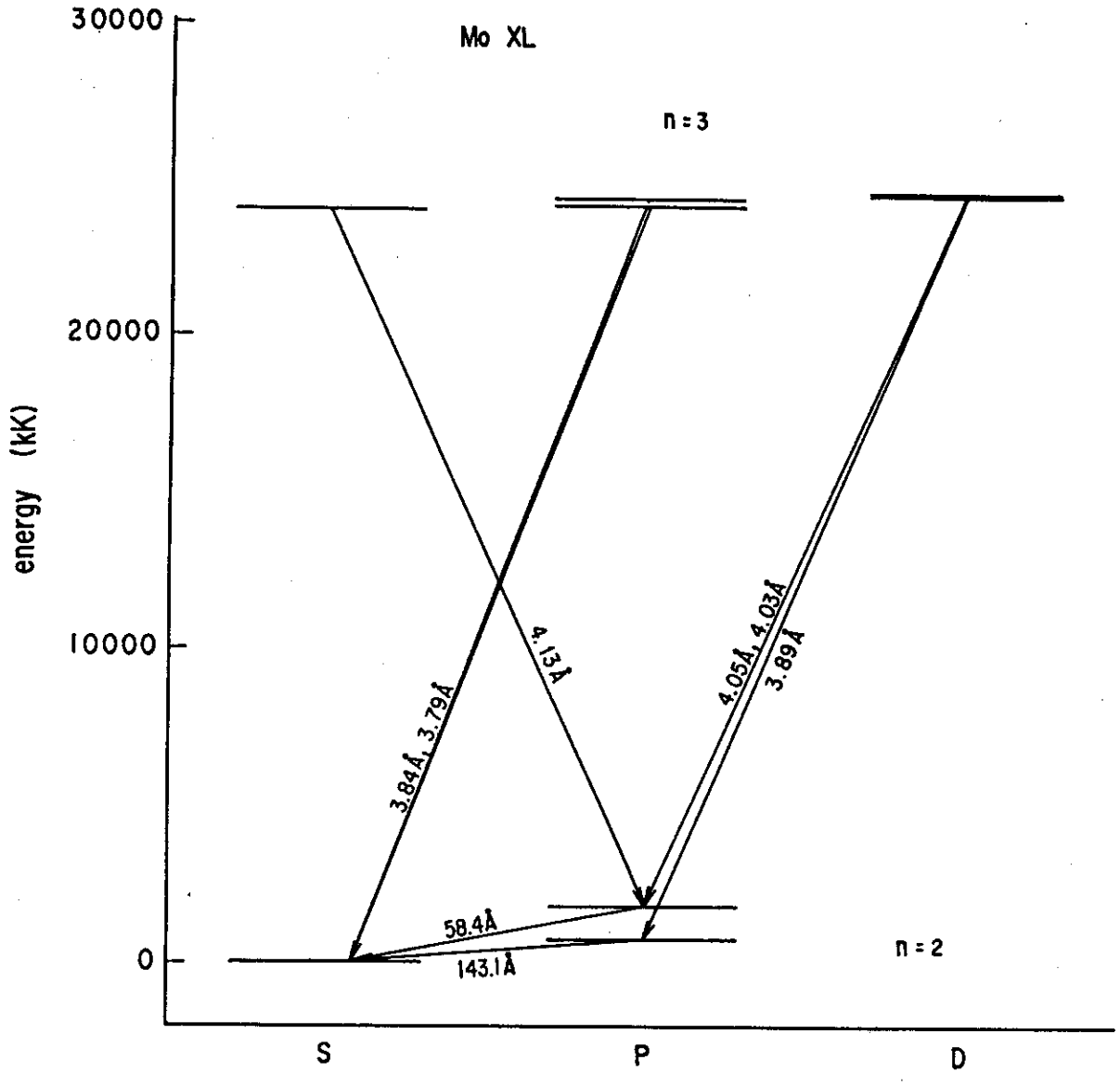
Mo XXXIX スペクトル・パターン
$(2s)^2-(2s)(3p)$

Mo XXXIX　波長，振動子強度

$(2s)^2 - (2s)(2p)$

$(2s)(3p)$

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
1	-0.005	0.0	721.996	1.0	138.504	0.0075	0.2595E+10
2	-0.005	0.0	2015.777	1.0	49.609	0.1391	0.3771E+12
3	-0.005	0.0	25536.766	1.0	3.916	0.2389	0.1039E+15
4	-0.005	0.0	25810.559	1.0	3.874	0.3985	0.1771E+15



Mo XL　グロトリアン・ダイアグラム

Mo XL　エネルギーレベル

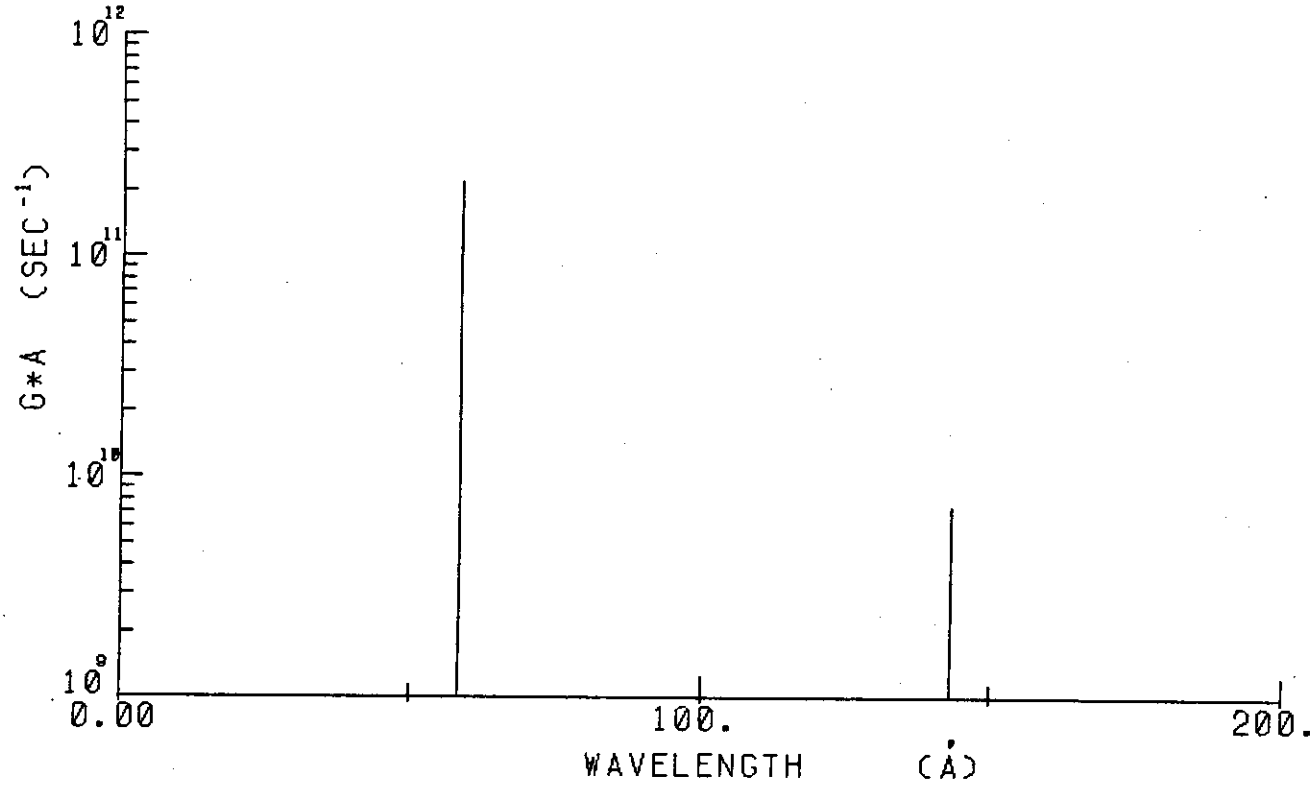
n＝2，3

EVEN PARITY

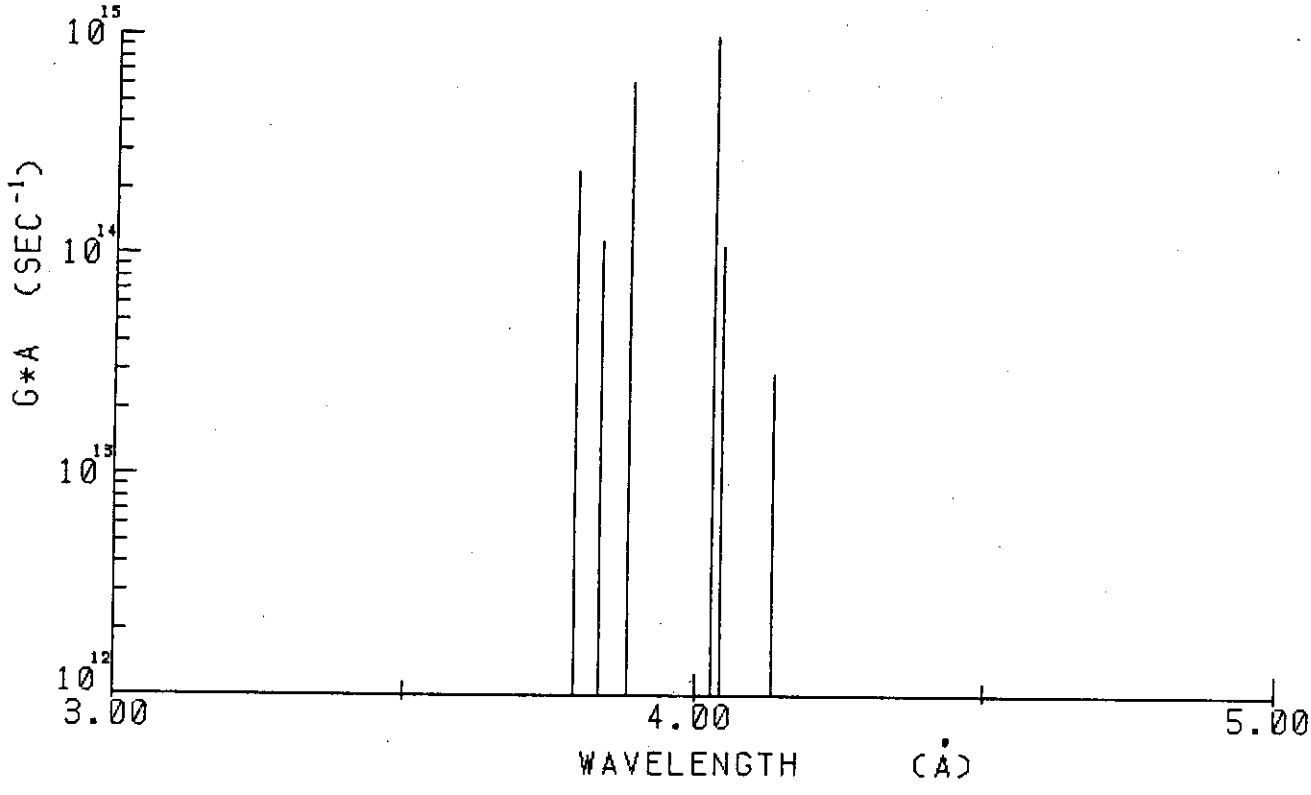
J	NO	ENERGY(KK)		LEADING PERCENTAGES	
0.5	1	0.0	---	1	2S100.0%
0.5	2	25909.039	---	2	2S100.0%
1.5	1	26433.340	---	3	2D100.0%
2.5	1	26527.066	---	3	2D100.0%

ODD PARITY

J	NO	ENERGY(KK)		LEADING PERCENTAGES	
0.5	1	698.785	---	1	2P100.0%
0.5	2	26072.922	---	2	2P100.0%
1.5	1	1713.637	---	1	2P100.0%
1.5	2	26375.211	---	2	2P100.0%



Mo XL　スペクトル・パターン
（2s）－（2p）



Mo XL　スペクトル・パターン
n＝2－3

Mo XL　波長，振動子強度

(2s) － (2p)
(3p)
(2p) － (3s)
(3d)

NO	LOWER LEVEL (KK)	J	UPPER LEVEL (KK)	J	WAVELENGTH (A)	GF	GA (SEC-1)
1	0.0	0.5	698.785	0.5	143.105	0.0226	0.7364E+10
2	0.0	0.5	1713.636	1.5	58.355	0.1109	0.2172E+12
3	25909.023	0.5	1713.636	1.5	4.133	0.0740	0.2889E+14
4	26433.324	1.5	1713.636	1.5	4.045	0.2652	0.1081E+15
5	26527.055	2.5	1713.636	1.5	4.030	2.3962	0.9840E+15
6	26433.324	1.5	698.785	0.5	3.886	1.3807	0.6099E+15
7	0.0	0.5	26072.910	0.5	3.835	0.2549	0.1156E+15
8	0.0	0.5	26375.199	1.5	3.791	0.5157	0.2393E+15