

Ref.

UNITED STATES
DEPARTMENT OF
COMMERCE
PUBLICATION

A11103 086005



NBS SPECIAL PUBLICATION 320
SUPPLEMENT 1

Bibliography on
Atomic Transition Probabilities
July 1969 through June 1971

U.S.
DEPARTMENT
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Office of Standard Reference Data—Office of Technical Information and Publications—Library—Office of Public Information—Office of International Relations.

¹ Headquarters and Laboratories at Gaithersburg, Maryland, unless otherwise noted; mailing address Washington, D.C. 20234.

² Part of the Center for Radiation Research.

³ Located at Boulder, Colorado 80302.

EP 27 1971

UNITED STATES DEPARTMENT OF COMMERCE • Maurice H. Stans, *Secretary*
NATIONAL BUREAU OF STANDARDS • Lewis M. Branscomb, *Director*

Bibliography on
Atomic Transition Probabilities

July 1969 through June 1971

J. R. Fuhr and W. L. Wiese
Institute for Basic Standards
National Bureau of Standards
Washington, D.C. 20234



U.S. National Bureau of Standards⁺ Special Publication 320 Supplement 1

Nat. Bur. Stand. (U.S.), Spec. Publ. 320 Suppl. 1, 67 pages (Sept. 1971)
CODEN: XNBSA

Issued September 1971

Contents

	Page
1. Introduction -----	V
Table of abbreviations used for classification of the articles -----	VI
2. Available numerical tables of critically evaluated transition probabilities -----	VII
3. Bibliography -----	1
3.1. General references -----	1
3.2. References on isoelectronic sequences -----	3
3.2.1. Allowed lines -----	3
3.2.2. Forbidden lines -----	5
3.3. References on individual elements and stages of ionization--	6

Bibliography on Atomic Transition Probabilities

July 1969 through June 1971*

J. R. Fuhr and W. L. Wiese

This is the first supplement to the NBS Special Publication 320, "Bibliography on Atomic Transition Probabilities," and it covers the most recent literature on the subject from July 1969 through June 1971. The papers are arranged according to elements and stages of ionization, and the method employed and classification of transitions are indicated for each reference. Only articles on discrete transitions, both allowed and forbidden, are listed. Papers containing data for many elements within isoelectronic sequences are collected separately in front of the list in order to keep this bibliography to a reasonable size. Also included is a selected list of new papers dealing with the subject of atomic transition probabilities from a general point of view.

Key words: Allowed; atomic; discrete; forbidden; transition probability.

1. Introduction

Since the publication of our latest "Bibliography on Atomic Transition Probabilities," in February 1970, the number of articles containing either numerical data or important reviews or comments of general interest has again increased considerably, namely by about 300 from the 1377 included there. This first supplement contains the references to all these new papers (and a few older papers that were missed before) which were received in the NBS library before June 30, 1971. In this supplement the format of the preceding bibliography¹ is retained.

Section 3.1 contains the important new papers dealing with the subject of atomic transition probabilities from a general point of view. However, we do not have new entries under all the subjects listed in the last bibliography. We would like to note that this section contains only selected papers of special interest.

In Section 3.2 we have listed those papers containing data for many spectra (about 20 spectra or more) along isoelectronic sequences and which are therefore rather comprehensive in nature. In these cases we have indicated the transitions for which the numerical data are given, in addition to listing the spectra that have been treated.

In Section 3.3 we have listed, in alphabetical order of the element symbols, all new references containing data on individual spectra and have classified these papers according to the methods employed. The key to the abbreviations follows on the next page. We have marked with an asterisk the element symbols of those species for which additional material is available from the papers listed in Section 3.2.

As an additional piece of information, we have assembled on page VII all available data tables of critically evaluated transition probabilities and their sources.

*This research was supported by the Advanced Research Projects Agency of the Department of Defense under the Strategic Technology Office.

¹ Miles, B. M., and Wiese, W. L., Bibliography on Atomic Transition Probabilities (January 1916 through June 1969), Nat. Bur. Stand. (U.S.), Spec. Publ. 320, 111 pages (Feb. 1970).

It is a pleasure to acknowledge the competent assistance of Miss J. Grabusnik and Mrs. R. Jones in arranging and typing this bibliography.

Table of Abbreviations Used for Classification of the Articles

Except where "rel." (relative) appears, absolute values have been determined.

A. Theoretical methods :

1. SCF—self-consistent field calculations
2. CA—Coulomb approximation
3. quant.—other quantum mechanical calculations
4. quant. forb.—quantum mechanical calculations for forbidden lines
5. estim.—estimations from sum rules, etc.
6. interp.—interpolation within isoelectronic sequences, spectral series or homologous atoms.

B. Experimental methods :

1. emiss.—measurements in emission (arc, furnace, discharge tube, shock tube, etc.)
2. absorpt.—measurements in absorption (King furnace, absorption tube, etc.)
3. life—lifetime measurements (including Hanle-effect)
4. hook—anomalous dispersion measurements
5. misc.—miscellaneous experimental methods (for example, Stark effect, astrophysical measurements, etc.)

C. Miscellaneous :

1. comm.—comments, additions, or corrections to other articles, methods, etc.
2. incompl.—article not yet classified (because translation is needed, incomplete information available, etc.)
3. compil.—compilations

Material on forbidden lines is marked as "forb."

2. Available Numerical Tables of Critically Evaluated Transition Probabilities

1. For the elements hydrogen through neon:

Wiese, W. L., Smith, M. W., and Glennon, B. M., Atomic Transition Probabilities, Vol. I. Nat. Stand. Ref. Data Ser., Nat. Bur. Stand. (U.S.), 4, 157 pages (May 1966).

2. For the elements sodium through calcium:

Wiese, W. L., Smith, M.W., and Miles, B. M., Atomic Transition Probabilities, Vol. II, Nat. Stand. Ref. Data Ser., Nat. Bur. Stand. (U.S.), 22, 306 pages (Oct. 1969).

3. For Ba I and II:

Miles, B. M., and Wiese, W. L., Critically Evaluated Transition Probabilities for Ba I and II, Nat. Bur. Stand. (U.S.), Tech. Note 474, 24 pages (Jan. 1969).

4. Selected updated material for elements hydrogen through calcium:

Wiese, W. L., and Miles, B. M., American Institute of Physics Handbook, ch. 7, 200-263, 3rd ed., (McGraw-Hill Book Co., Inc., New York, N.Y. 1971).

3. BIBLIOGRAPHY

3.1 GENERAL REFERENCES

A. TABLES OF NUMERICAL VALUES

Wiese, W. L. & Miles, B. M., "American Institute of Physics Handbook," ch. 7, 200-263, 3rd edition (McGraw-Hill, New York, 1971).

* * * * *

B. PREVIOUS LITERATURE COMPILATIONS

Miles, B. M. & Wiese, W. L., "Bibliography on Atomic Transition Probabilities (January 1916 through June 1969)," National Bureau of Standards Special Publication 320 (U. S. Government Printing Office, Washington, D. C., 1970).

* * * * *

C. REVIEW ARTICLES

Garstang, R. H., Mem. Soc. Roy. Sci. Liege, Ser. 5 17, 35-44 (1969).

Transactions of the International Astronomical Union, Vols. VII (1950), VIII (1952), IX (1955), X (1958), XI (1961), XII (1964), XIII (1967), XIV A (1970).

Weiss, A. W., Nucl. Instrum. Methods 90, 121-131 (1970) (Theoretical Methods).

Wiese, W. L., Nucl. Instrum. Methods 90, 25-33 (1970).

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D. FUNDAMENTAL RELATIONSHIPS AND BASIC CONCEPTS

No new entries.

* * * * *

E. DETAILED DESCRIPTIONS OF EXPERIMENTAL OR THEORETICAL METHODS

Corney, A., "Advances in Electronics and Electron Physics," 29, 115-231 (Academic Press Inc., New York, 1970) (Lifetime Methods).

Crossley, R.J.S., "Advances in Atomic and Molecular Physics," 5, 237-296 (Academic Press Inc., New York, 1969).

Lochte-Holtgreven, W., ed. "Plasma Diagnostics," (John Wiley and Sons, Inc., New York, 1968) (Emission Method)

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F. GENERAL COMMENTS

Carre, M., Gaillard, M. L., & Subtil, J. L., Nucl. Instrum. Methods 90, 217-222 (1970) (Cascade corrections).

Curtis, L. J., Berry, H. G., & Bromander, J., Physica Scripta 2, 216-220 (1970) (Cascade analysis techniques).

Curtis, L. J., Schectman, R. M., Kohl, J. L., Chojnacki, D. A. & Shoffstall, D. R., Nucl. Instrum. Methods 90, 207-216 (1970) (Cascade analysis techniques).

Dekker, E., Astron. and Astrophys. 1, 72-76 (1969) (Generalized relative multiplet strengths).

Friedrich, H., Katterback, K. & Trefftz, E., J. Quant. Spectrosc. Radiat. Transfer 10, 11-16 (1970)
(On accuracy of machine programs for calculating oscillator strengths by Coulomb approximation).

Starace, A. F., Phys. Rev. A 3, 1242-1245 (1971) (Comments on length and velocity approximations).

Takens, R. J., Astron. & Astrophys. 5, 244-263 (1970) (Critical analysis of free-burning arcs).

Wangness, R. K., Phys. Rev. A 3, 1275-1278 (1971) (Cascade effects in Hanle technique).

Weinhold, F., J. Chem. Phys. 54, 1874-1881 (1971) (Upper and lower bounds to oscillator strengths).

Wiese, W. L., Nucl. Instrum. Methods 90, 25-33 (1970) (On the importance of cascade effects).

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G. ENVIRONMENTAL INFLUENCES ON TRANSITION PROBABILITIES

No new entries.

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3.2.1 Allowed Lines

Alli, M. A. & Schaad, L. J. Mol. Phys. 17, 441-448 (1969). quant.

Transitions treated:

All possible allowed l-combinations within the n=4 shell of the He Sequence.

* * * * *

Safronova, U. L., Ivanova, A. N. Optics and Spectroscopy (U.S.S.R.) 28, 313-314 quant.

& Kharitonova, V. N.

(1970).

Transitions treated:

He Sequence:

$\underline{1S - 1P^0}$	$\underline{3S - 3P^0}$
$1s^2 - 1snp$ (n=2,3,4,5)	$1s2s - 1snp$ (n=2,3)
$1s2s - 1snp$ (n=2,3)	$1s3s - 1snp$ (n=2,3)
$1s3s - 1snp$ (n=2,3)	

* * * * *

Smith, M. W. & Wiese, W. L. Astrophys. J. Suppl. Ser. 23, #196, 103-192 interp.

(1971).

Transitions treated:

Numerous transitions in the isoelectronic sequences of He through Mg, especially for highly-ionized spectra.

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Alli, M. A. & Schaad, L. J. J. Phys. B. Ser. 2, 2, 1018-1027 (1969). quant.

Transitions treated:

$3s \ 1S - 3p \ 1P^0$ and $3s \ 3S - 3p \ 3P^0$
 $3p \ 1P^0 - 3d \ 1D$ and $3p \ 3P^0 - 3d \ 3D$
of the Be Sequence.

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Linderberg, J. Phys. Letters 29A, 467-468 (1969). quant.

Transitions treated:

$2s2p \ 1P^0 - 2p^2 \ 1D$ of the Be Sequence.

* * * * *

Matematicheskikh Nauk, No. 44, 20-24 (1969).

Transitions treated:

$2s^2 1S - 2s2p 1,3P^0$ of the Be Sequence through Ar XV

$3s^2 1S - 3s3p 1,3P^0$ of the Mg Sequence through Co XVI.

* * * * *

393 (1969).

Transitions treated:

All lines of the $2p^4 - 2p^3s$ array for the θ Sequence through Fe XIX.

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3.2.2 Forbidden Lines

The $1s^2 1S - 1s2s 3S$ transition of the He Sequence is treated in the following papers:

- | | | |
|------------------------------|---|--------------|
| Drake, G. W. F. | Phys. Rev. A <u>3</u> , 908-915 (1971). | quant. forb. |
| Feinberg, G. & Sucher, J. | Phys. Rev. Letters <u>26</u> , 681-684 (1971) and <u>26</u> ,
1084 (1971). | quant. forb. |
| Gabriel, A. H., & Jordan, C. | Phys. Letters, <u>32A</u> , 166-167 (1970). | comm. |
| Griem, H. R. | Astrophys. J. <u>156</u> , L103-L105 (1969); <u>161</u> , L155
(1970). | estim. forb. |

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|-----------------|--|--------------|
| Drake, G. W. F. | Astrophys. J. <u>158</u> , 1199-1203 (1969); <u>163</u> , 439
(1971). | quant. forb. |
|-----------------|--|--------------|

Transitions treated:

$1s^2 1S_0 - 1s2p 3P_2^0$ magnetic quadrupole transitions of the He Sequence.

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3.3 REFERENCES ON INDIVIDUAL ELEMENTS AND STAGES OF IONIZATION

AUTHOR	JOURNAL	CLASSIFICATION
Ag (Silver)		
Ag I		
Addink, N. W. H.	"Proc. of XIV Colloquium Spectroscopicum Internationale," B1, 201-208 (Debrecen, Hungary, 1967).	comm.
Andersen, T., Jessen, K. A., & Sørensen, G.	Nucl. Instrum. Methods <u>90</u> , 35-39 (1970).	life
Gabla, K. & Kunisz, M.	Acta Phys. Polon. <u>A37</u> , 391-396 (1970).	emiss., rel

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Al (Aluminum)*

Al I		
Andersen, T., Jessen, K. A. & Sørensen, G.	J. Opt. Soc. Am. <u>59</u> , 1197-1201 (1969).	life
Goldman, A.	Scientific Report No. 5, Sept. (1969) AFCRL-69-0447, Univ. of Denver, Denver, Colo.	CA
Andersen, T., Jessen, K. A., & Sørensen, G.	Nucl. Instrum. Methods <u>90</u> , 35-39 (1970).	life
Smith, W. H.	Nucl. Instrum. Methods <u>90</u> , 115-119 (1970).	life
Stuck, H. L. & Zimmermann, P.	Z. Physik <u>239</u> , 345-350 (1970).	life

Al II

Andersen, T., Jessen, K. A. & Sørensen, G.	J. Opt. Soc. Am. <u>59</u> , 1197-1201 (1969).	life
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*See also Section 3.2 for some further references.

Berry, H. G., Bromander, J., & Buchta, R.	Phys. Scripta <u>1</u> , 181-183 (1970).	life
Bromander, J., Berry, H. G., & Buchta, R.	Nucl. Instrum. Methods <u>90</u> , 55-58 (1970).	life
Smith, W. H.	Nucl. Instrum. Methods <u>90</u> , 115-119 (1970).	life

Al III

Andersen, T., Jessen, K. A. & Sørensen, G.	J. Opt. Soc. Am. <u>59</u> , 1197-1201 (1969).	life
Berry, H. G., Bromander, J., & Buchta, R.	Phys. Scripta <u>1</u> , 181-183 (1970).	life
Bromander, J., Berry, H. G., & Buchta, R.	Nucl. Instrum. Methods <u>90</u> , 55-58 (1970).	life

Al IX

Weiss, A. W.	Phys. Rev. <u>188</u> , 119-130 (1969).	interp.
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Al XII

Brown, R. T.	Astrophys. J. <u>158</u> , 829-837 (1969).	quant.
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Ar (Argon)*

Ar I

Chenevier, M. & Gouillet, G.	J. Physique Suppl. C1, <u>30</u> , 84-88 (1969).	life
Desai, S. V. & Corcoran, W. H.	J. Quant. Spectrosc. Radiat. Transfer <u>2</u> , 1489-1491 (1969).	comm.
Meiners, H. M	J. Quant. Spectrosc. Radiat. Transfer <u>2</u> , 1493-1506 (1969).	SCF
Wiese, W. L., Bridges, J. M., Kornblith, R. L., & Kelleher, D. E.	J. Opt. Soc. Am. <u>59</u> , 1206-1212 (1969).	emiss.
Wujec, T.	Acta. Phys. Polon. <u>36</u> , 269-271 (1969).	emiss.
Aymar, M., Feneuille, S., & Klapisch, M.	Nucl. Instrum. Methods <u>90</u> , 137-143 (1970).	quant.

*See also Section 3.2 for some further references.

Burnham, R. & Isler, R. C.	Bull. Am. Phys. Soc. II, <u>15</u> , 213 (1970).	life
Geiger, J.	Phys. Letters <u>33A</u> , 351-352 (1970).	misc.
Nodwell, R. A., Meyer, J. & Jacobson, T.	J. Quant. Spectrosc. Radiat. Transfer <u>10</u> , 335- 340 (1970).	life, emis rel., ab- sorpt. re
Quang Rang, L.	Comp. rend. <u>271B</u> , 389-392 (1970).	quant.
De Jongh, J. P. & Van Eck, J.	Physica <u>51</u> , 104-112 (1971).	absorpt.
Giannaris, R. J. & Incropera, F. P.	J. Quant. Spectrosc. Radiat. Transfer <u>11</u> , 291-307 (1971).	compil.
Grandin, J. P., Lecler, D., & Margerie, J.	Comp. rend. <u>272B</u> , 929-932 (1971).	life

Ar II

Webb, C. E., Miller, R. C., & Tang, C. L.	IEEE J. Quant. Elect. <u>QE-4</u> , 357 (1968).	life
Koozekanani, S. H., & Trusty, G. L.	J. Opt. Soc. Am. <u>59</u> , 1281-1284 (1969).	quant.
Assousa, G. E., Brown, L., & Ford, Jr., W. K.	J. Opt. Soc. Am. <u>60</u> , 1311-1314 (1970).	life
Assousa, G. E., Brown, L., & Ford, Jr., W. K.	Nucl. Instrum. Methods <u>90</u> , 51-54 (1970).	life
Camhy-Val, C. & Dumont, A. M.	Astron. Astrophys. <u>2</u> , 490 (1970).	comm.
Camhy-Val, C., Dumont, A. M., Druex, M., & Vitry, R.	Phys. Letters <u>32A</u> , 233-234 (1970).	life
Denis, A. & Gaillard, M.	Phys. Letters <u>31A</u> , 9-10 (1970).	life
Fink, U., Bashkin, S., & Bickel, W. S.	J. Quant. Spectrosc. Radiat. Transfer <u>10</u> , 1241- 1256 (1970).	life
Kernahan, J. A., Lin, C. C. & Pinnington, E. H.	J. Opt. Soc. Am. <u>60</u> , 898-901 (1970).	life
Nerheim, N. M., & Olsen, H. N.	J. Quant. Spectrosc. Radiat. Transfer <u>10</u> , 755- 773 (1970).	comm.

Ar III

Gruzdev, P. F.	Optics and Spectroscopy (U.S.S.R.) <u>28</u> , 334-337 (1969).	quant.
Fink, U., Bashkin, S., & Bickel, W. S.	J. Quant. Spectrosc. Radiat. Transfer <u>10</u> , 1241- 1256 (1970).	life
Kernahan, J. A., Lin, C. C. & Pinnington, E. H.	J. Opt. Soc. Am. <u>60</u> , 898-901 (1970).	life
Ceyzeriat, P., Denis, A. & Dufay, M.	J. Opt. Soc. Am. <u>61</u> , 641-642 (1971).	life, CA

Ar IV

- Czyzak, S. J. & Krueger, T. K. Monthly Notices Roy. Astron. Soc. 129, 103 (1965). comm. forb.
 Ali, M. A. & Joy, H. W. J. Phys. B (Atom. Molec. Phys.) 3, 1552-1557 (1970). SCF

Ar XIII

- Nussbaumer, H. Astrophys. J. 166, 411-422 (1971). quant. forb.

Ar XVII

- Garstang, R. H. Publ. Astron. Soc. Pacific 81, 488-495 (1969). quant. forb.
 Schmieder, R. W. & Marrus, R. Phys. Rev. Letters 25, 1245-1248 (1970). life, forb.
 Marrus, R. & Schmieder, R. W. Phys. Rev. Letters 25, 1689-1691 (1970). life, forb.

Ar XVIII

- Schmieder, R. W. & Marrus, R. Phys. Rev. Letters 25, 1692-1695 (1970). life, forb.

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Au (Gold)

Au I

- Ashenfelter, R. C. Thesis, California Institute of Technology (1967). absorpt.
 Addink, N. W. H. "Proc. of XIV Colloquium Spectroscopicum comm.
 Internationale," B1, 201-208 (Debrecen,
 Hungary, 1967).
 Gabla, K. & Kunisz, M. Acta Phys. Polon. A37, 391-396 (1970). emiss., rel.

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B (Boron)*

B I

- Andersen, T., Jessen, K. A. & Phys. Rev. 188, 76-81 (1969). life
 Sørensen, G.

*See also Section 3.2 for some further references.

Weiss, A. W.	Phys. Rev. <u>188</u> , 119-130 (1969).	quant.
Martinson, I., Bickel, W. S. & Olme, A.	J. Opt. Soc. Am. <u>60</u> , 1213-1220 (1970).	life
Smith, W. H.	Nucl. Instrum. Methods <u>90</u> , 115-119 (1970).	life

B II

Andersen, T., Jessen, K. A. & Sørensen, G.	Phys. Rev. <u>188</u> , 76-81 (1969).	life
Martinson, I.	Nucl. Instrum. Methods <u>90</u> , 81-84 (1970).	life
Martinson, I., Bickel, W. S. & Olme, A.	J. Opt. Soc. Am. <u>60</u> , 1213-1220 (1970).	life

B III

All, M. A. & Schaad, L. J.	J. Phys. B (Proc. Phys. Soc.) Ser. 2, <u>2</u> , 1304-1308 (1969).	quant.
Andersen, T., Jessen, K. A. & Sørensen, G.	Phys. Rev. <u>188</u> , 76-81 (1969).	life
Martinson, I.	Nucl. Instrum. Methods <u>90</u> , 81-84 (1970).	life
Martinson, I., Bickel, W. S. & Olme, A.	J. Opt. Soc. Am. <u>60</u> , 1213-1220 (1970).	life

B IV

Senashenko, V. S. & Teku, B.	Vestnik Moskovskogo Universitet Ser. 3 fiz. i astron., 120-122 (1968).	quant.
Brown, R. T.	Astrophys. J. <u>158</u> , 829-837 (1969).	quant.
Drake, G.W.F. & Dalgarno, A.	Phys. Rev. A <u>1</u> , 1325-1329 (1970).	quant.
Martinson, I.	Nucl. Instrum. Methods <u>90</u> , 81-84 (1970).	life
Martinson, I., Bickel, W. S. & Olme, A.	J. Opt. Soc. Am. <u>60</u> , 1213-1220 (1970).	life

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Ba (Barium)

Ba I

Chenevier, M. & Gouillet, G.	J. Physique Suppl. C1, <u>30</u> , 84-88 (1969).	life
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Andersen, T., Jessen, K. A., & Sørensen, G.	Nucl. Instrum. Methods <u>90</u> , 35-39 (1970).	life
Dickie, L. O. & Kelly, F. M.	Can. J. Phys. <u>48</u> , 879-883 (1970).	life
Hudson, R. D., Carter, V. L., & Young, P. A.	Phys. Rev. A, <u>2</u> , 643-648 (1970).	absorpt.
Dickie, L. O. & Kelly, F. M.	Can. J. Phys. <u>49</u> , 1098-1102 (1971).	life

Ba II

Chenevier, M. & Gouillet, G.	J. Physique Suppl. C1, <u>30</u> , 84-88 (1969).	life
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Be (Beryllium)*

Be I

Andersen, T., Jessen, K. A. & Sørensen, G.	Phys. Rev. <u>188</u> , 76-81 (1969).	life
McGinn, G.	J. Chem. Phys. <u>51</u> , 5090-5095 (1969).	quant.

Be II

All, M. A. & Schaad, L. J.	J. Phys. B (Proc. Phys. Soc.) Ser. 2, <u>2</u> , 1304-1308 (1969).	quant.
Andersen, T., Jessen, K. A. & Sørensen, G.	Phys. Rev. <u>188</u> , 76-81 (1969).	life
Berry, H. G., Martinson, I., & Bromander, I.	Phys. Letters <u>31A</u> , 521-522 (1970).	life
Martinson, I.	Nucl. Instrum. Methods <u>90</u> , 81-84 (1970).	life

Be III

Senashenko, V. S. & Teku, B.	Vestnik Moskovskogo Universitet Ser. 3 fiz. i astron., 120-122 (1968).	quant.
Andersen, T., Jessen, K. A. & Sørensen, G.	Phys. Rev. <u>188</u> , 76-81 (1969).	life
Brown, R. T.	Astrophys. J. <u>158</u> , 829-837 (1969).	quant.

*See also Section 3.2 for some further references.

* * * * *

Br (Bromine)

Br I

Bengtson, R. D., Miller, M. H.,

Phys. Rev. A 3, 16-24 (1971).

emiss.

Koopman, D. W., & Wilkerson, T. D.

Br II

Gruzdev, P. F.

Optics and Spectroscopy (U.S.S.R.) 27, 479-481
(1969).

quant.

* * * * *

C (Carbon)*

C I

Wilson, K. H., & Nicolet, W. E.

J. Quant. Spectrosc. Radiat. Transfer 7, 891-941
(1967).

SCF, compil.

Goldman, A.

Scientific Report No. 5, Sept. (1969) AFCRL-
69-0447, Univ. of Denver, Denver, Colo.

CA

Berry, H. G., Martinson, I., &

Phys. Letters 31A, 521-522 (1970).

life

Bromander, I.

Foster, E. W.

J. Phys. B (Proc. Phys. Soc.) 3, L145-L148 (1970).

emiss.

Mickey, D. L.

Nucl. Instrum. Methods 90, 77-79 (1970).

life

Nicolaidis, C., & Sinanoglu, O.

Phys. Letters 33A, 178-179 (1970).

quant.

Pegg, D. J., Chupp, E. L., &

Nucl. Instrum. Methods 90, 71-75 (1970); 92,
527-531 (1971).

life

Dotchin, L. W.

Pegg, D. J., Dotchin, L. W. &

Phys. Letters 31A, 255-256 (1970).

life

Chupp, E. L.

*See also Section 3.2 for some further references.

Pegg, P. J., Dotchin, L. W., & Chupp, E. L.	Phys. Letters <u>31A</u> , 501-502 (1970).	life
Poulizac, M. C. & Druetta, M.	Comp. rend. <u>270B</u> , 788-790 (1970).	life
van Rensbergen, W.	Solar Phys. <u>11</u> , 11-16 (1970).	quant.
Nussbaumer, H.	Astrophys. J. <u>166</u> , 411-422 (1971).	quant. forb.

C II

Wilson, K. H., & Nicolet, W. E.	J. Quant. Spectrosc. Radiat. Transfer <u>7</u> , 891-941 (1967).	SCF, compil.
Poulizac, M. C., Druetta, M., & Ceyzeriat, P.	Phys. Letters <u>30A</u> , 87-88 (1969).	life
Sinanoglu, O.	"Atomic Physics," 131-160 (Plenum Press, New York, 1969).	quant.
Westhaus, P. & Sinanoglu, O.	Phys. Rev. <u>183</u> , 56-68 (1969); Astrophys. J. <u>157</u> , 997-1005 (1969).	quant.
Martinson, I. & Bickel, W. S.	Phys. Letters <u>31A</u> , 25-26 (1970).	life
Mickey, D. L.	Nucl. Instrum. Methods <u>90</u> , 77-79 (1970).	life
Nicolaides, C. & Sinanoglu, O.	Nucl. Instrum. Methods <u>90</u> , 133-136 (1970).	quant.
Pegg, D. J., Chupp, E. L., & Dotchin, L. W.	Nucl. Instrum. Methods <u>90</u> , 71-75 (1970); <u>92</u> , 527-531 (1971).	life
Pegg, P. J., Dotchin, L. W., & Chupp, E. L.	Phys. Letters <u>31A</u> , 501-502 (1970).	life
Poulizac, M. C. & Druetta, M.	Comp. rend. <u>270B</u> , 788-790 (1970).	life
Ceyzeriat, P., Denis, A., Desesquelles, J., Druetta, M., & Poulizac, M. C.	Nucl. Instrum. Methods <u>90</u> , 103-108 (1970).	life
Hutchison, R. B.	J. Quant. Spectrosc. Radiat. Transfer <u>11</u> , 81-91 (1971).	life

C III

Poulizac, M. C., Druetta, M., & Ceyzeriat, P.	Phys. Letters <u>30A</u> , 87-88 (1969).	life
Martinson, I. & Bickel, W. S.	Phys. Letters <u>31A</u> , 25-26 (1970).	life
Mickey, D. L.	Nucl. Instrum. Methods <u>90</u> , 77-79 (1970).	life
Pegg, D. J., Chupp, E. L., & Dotchin, L. W.	Nucl. Instrum. Methods <u>90</u> , 71-75 (1970); <u>92</u> , 527-531 (1971).	life
Pegg, P. J., Dotchin, L. W., & Chupp, E. L.	Phys. Letters <u>31A</u> , 501-502 (1970).	life

Poulizac, M. C. & Druetta, M.	Comp. rend. <u>270B</u> , 788-790 (1970).	life
Ceyzeriat, P., Denis, A., Desesquelles, J., Druetta, M., & Poulizac, M. C.	Nucl. Instrum. Methods <u>90</u> , 103-108 (1970).	life

C IV

All, M. A. & Schaad, L. J.	J. Phys. B (Proc. Phys. Soc.) Ser. 2, <u>2</u> , 1304-1308 (1969).	quant.
Poulizac, M. C., Druetta, M., & Ceyzeriat, P.	Phys. Letters <u>30A</u> , 87-88 (1969).	life
Barrette, L., Knystautas, E. J., Neveu, B., & Drouin, R.	Nucl. Instrum. Methods <u>90</u> , 59-61 (1970).	life
Martinson, I.	Nucl. Instrum. Methods <u>90</u> , 81-84 (1970).	life
Martinson, I. & Bickel, W. S.	Phys. Letters <u>31A</u> , 25-26 (1970).	life
Poulizac, M. C. & Druetta, M.	Comp. rend. <u>270B</u> , 788-790 (1970).	life
Knystautas, E. J., Barrette, L., Neveu, B. & Drouin, R.	J. Quant. Spectrosc. Radiat. Transfer <u>11</u> , 75-79 (1971).	life

C V

Senashenko, V. S. & Teku, B.	Vestnik Moskovskogo Universitet Ser. 3 fiz. i astron., 120-122 (1968).	quant.
Brown, R. T.	Astrophys. J. <u>158</u> , 829-837 (1969).	quant.
Dalgarno, A., & Drake, G. W. F.	Mem. de la Societe Royale des Sciences de Liege 5th Series <u>17</u> , 69-77 (1969).	quant. forb
Garstang, R. H.	Publ. Astron. Soc. Pacific <u>81</u> , 488-495 (1969).	quant. forb
Drake, G.W.F. & Dalgarno, A.	Phys. Rev. A <u>1</u> , 1325-1329 (1970).	quant.
Dufay, M., Denis, A., & Desesquelles, J.	Nucl. Instrum. Methods <u>90</u> , 85-91 (1970).	life
Martinson, I. & Bickel, W. S.	Phys. Letters <u>31A</u> , 25-26 (1970).	life

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Ca (Calcium)*

Ca I

Brinkmann, U.	Z. Physik <u>228</u> , 440-453 (1969).	comm.
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*See also Section 3.2 for some further references.

Brinkmann, U., Goschler, J., Steudel, A., & Walther, H.	"Optical Pumping and Atomic Line Shape," 433-439 (ed. Skalinski, T., Panstwowe Wydawnictwo Naukowe, Warsaw, 1969).	life
Brinkmann, U., Goschler, J., Steudel, A. & Walther, H.	Z. Physik <u>228</u> , 427-439 (1969).	life
Goldman, A.	Scientific Report No. 5, Sept. (1969) AFCRL- 69-0447, Univ. of Denver, Denver, Colo.	CA
McGinn, G.	J. Chem. Phys. <u>51</u> , 5090-5095 (1969).	quant.
Andersen, T., Desesquelles, J., Jessen, K. A., & Sørensen, G.	J. Quant. Spectrosc. Radiat. Transfer <u>10</u> , 1143- 1150 (1970).	life
Andersen, T., Jessen, K. A., & Sørensen, G.	Nucl. Instrum. Methods <u>90</u> , 35-39 (1970).	life
Smith, W. H.	Nucl. Instrum. Methods <u>90</u> , 115-119 (1970).	life
Ca II		
Goldman, A.	Scientific Report No. 5, Sept. (1969) AFCRL- 69-0447, Univ. of Denver, Denver, Colo.	CA
Andersen, T., Desesquelles, J., Jessen, K. A., & Sørensen, G.	J. Quant. Spectrosc. Radiat. Transfer <u>10</u> , 1143- 1150 (1970).	life
Smith, W. H.	Nucl. Instrum. Methods <u>90</u> , 115-119 (1970).	life
van Rensbergen, W.	Solar Phys. <u>11</u> , 11-16 (1970).	quant.
Ca V		
Gruzdev, P. F.	Optics and Spectroscopy (U.S.S.R.) <u>28</u> , 334-337 (1969).	quant.
Ca VI		
Ali, M. A. & Joy, H. W.	J. Phys. B (Atom. Molec. Phys.) <u>3</u> , 1552-1557 (1970).	SCF
Ca XV		
Nussbaumer, H.	Astrophys. J. <u>166</u> , 411-422 (1971).	quant. forb.

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Cd (Cadmium)

Cd I

Ashenfelter, R. C.	Thesis, California Institute of Technology (1967).	absorpt.
Addink, N. W. H.	"Proc. of XIV Colloquium Spectroscopicum Internationale," B1, 201-208 (Debrecen, Hungary, 1967).	comm.
Bieniewski, T. M., Krueger, T. K., & Czyzak, S. J.	Ad. Quant. Chem. <u>4</u> , 141-152 (1968).	absorpt., S
Andersen, T., Jessen, K. A., & Sørensen, G.	Nucl. Instrum. Methods <u>90</u> , 35-39 (1970).	life
Baumann, S. R. & Smith, W. H.	J. Opt. Soc. Am. <u>60</u> , 345-347 (1970).	life
Laniece, B.	J. Physique <u>31</u> , 439-444 (1970).	life
Schaefer, A. R.	J. Quant. Spectrosc. Radiat. Transfer <u>11</u> , 197-201 (1971).	life

Cd II

Baumann, S. R. & Smith, W. H.	J. Opt. Soc. Am. <u>60</u> , 345-347 (1970).	life
Schaefer, A. R.	J. Quant. Spectrosc. Radiat. Transfer <u>11</u> , 197-201 (1971).	life

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Ce (Cerium)

Ce II

Tech, J. L.	NBS Monograph 119 (U. S. Government Printing Office, Washington, D. C., 1971).	comm.
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Cl (Chlorine)*

Cl I

Bengtson, R. D., Miller, M. H.,
Koopman, D. W., & Wilkerson, T. D. Phys. Rev. A 3, 16-24 (1971). emiss.

Cl II

Gruzdev, P. F. Optics and Spectroscopy (U.S.S.R.) 28, 334-337 (1969). quant.
Bengtson, R. D., Miller, M. H.,
Koopman, D. W., & Wilkerson, T. D. Phys. Rev. A 3, 16-24 (1971). emiss.

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Co (Cobalt)*

Co I

Addink, N. W. H. "Proc. of XIV Colloquium Spectroscopicum
Internationale," B1, 201-208 (Debrecen,
Hungary, 1967). comm.
v. Hartrott, M. Z. Naturforsch. 24a, 1202-1209 (1969). life

Co II

Vizbaraite, Ya. I., Rudzikas, Z. Litovskii Fizicheskii Sbornik (S.S.S.R.) 8, quant.
B., Dosinas, G. I., & Yutsis, A. P. 319-330 (1968).
Rudzikas, Z. B., Vizbaraite, Ya. I., Litovskii Fizicheskii Sbornik (S.S.S.R.) 8, quant.
Dosinas, G. I., & Yutsis, A. P. 331-342 (1968).
Kychkin, I. S., Rudzikas, Z. B., & Litovskii Fizicheskii Sbornik (S.S.S.R.) 10, quant.,
Vizbaraite, Ya. I. 47-58 (1970). quant. forb.

Co III

Rudzikas, Z. B., & Yutsis, A. P. Litovskii Fizicheskii Sbornik 9, 433-447 (1969). quant. forb.

*See also Section 3.2 for some further references.

Co VIII

Warner, B. & Kirkpatrick, R. C.	Monthly Notices Roy. Astron. Soc. <u>144</u> , 397-410 (1969).	quant., quant. forb.
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Co XII

Gruzdev, P. F.	Optics and Spectroscopy (U.S.S.R.) <u>28</u> , 334-337 (1969).	quant.
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Co XVII

McEachran, R. P., Tull, C. E. & Cohen, M.	Astron. Astrophys. <u>4</u> , 152-155 (1970).	quant.
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Co XIX

Cohen, L., Feldman, U., & Kastner, S. O.	J. Opt. Soc. Am. <u>58</u> , 331-334 (1968).	quant.
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Cr (Chromium)*

Cr I

Hutcherson, J. W., Mundy, B. C. & Hefferlin, R.	Appl. Spectrosc. <u>20</u> , 12-17 (1966).	emiss., rel.
Addink, N. W. H.	"Proc. of XIV Colloquium Spectroscopicum Internationale," B1, 201-208 (Debrecen, Hungary, 1967).	comm.
Wolnik, S. J., Berthel, R. O., Carnevale, E. H. & Wares, G. W.	Astrophys. J. <u>152</u> , 983-995 (1969).	emiss.
Lvov, B. V.	Optics and Spectroscopy (U.S.S.R.) <u>28</u> , 8-12 (1970).	absorpt., rel.
Cocke, C. L., Jr., Curnutte, B., & Brand, J. H.	Bull. Am. Phys. Soc. Ser. II <u>16</u> , 532 (1971).	life

*See also Section 3.2 for some further references.

Cr II

Nussbaumer, H., & Swings, J. P. Astrophys. J. 162, 589-596 (1970). quant. forb.

Cr III

Kychkin, I. S., Rudzikas, Z., & Litovskii Fizicheskii Sbornik (S.S.S.R.) 2, quant.
Vizbaraitė, Ya. 277-286 (1969).

Cr IV

Rudzikas, Z. B., & Yutsis, A. P. Litovskii Fizicheskii Sbornik 2, 433-447 (1969). quant. forb.

Cr V

Warner, B. & Kirkpatrick, R. C. Monthly Notices Roy. Astron. Soc. 144, 397-410 quant.,
(1969). quant. forb.

Cr IX

Gruzdev, P. F. Optics and Spectroscopy (U.S.S.R.) 28, 334-337 quant.
(1969).

Cr X

Ali, M. A. & Joy, H. W. J. Phys. B (Atom. Molec. Phys.) 3, 1552-1557 SCF
(1970).

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Cs (Cesium)

Cs I

Stone, P. M. Phys. Rev. 135, 1151-1156 (1962); 135A, AB2 quant., comm.
(1964).

Gridneva, S. M. & Kasabov, G. A. "Proc. 7th Inter. Conf. Ionization Phenomena in emiss.
Gases," Vol. II, 581-585 (Gradevinske Knjiga
Publishing House, Beograd, 1966).

Svandberg, S. & Rydberg, S.	Z. Physik <u>227</u> , 216-233 (1969).	life
Altman, E. L.	Optics and Spectroscopy (U.S.S.R.) <u>28</u> , 556 (1970).	life
Altman, E. L., & Kazantsev, S. A.	Optics and Spectroscopy (U.S.S.R.) <u>28</u> , 432-433 (1970).	life
Beigman, I. L., Vainshtein, L. A. & Shevelko, V. P.	Optics and Spectroscopy (U.S.S.R.) <u>28</u> , 229-231 (1970).	quant.
Schmieder, R. W., Lurio, A., Happer, W., & Khadjavi, A.	Phys. Rev. A <u>2</u> , 1216-1228 (1970).	life

Cs IV

Gruzdev, P. F.	Optics and Spectroscopy (U.S.S.R.) <u>27</u> , 479-481 (1969).	quant.
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Cu (Copper)

Cu I

Ashenfelter, R. C.	Thesis, California Institute of Technology (1967).	absorpt.
Addink, N. W. H.	"Proc. of XIV Colloquium Spectroscopicum Internationale," B1, 201-208 (Debrecen, Hungary, 1967).	comm.
Andersen, T., Jessen, K. A., & Sørensen, G.	Nucl. Instrum. Methods <u>90</u> , 35-39 (1970).	life
Bell, G. D. & Tubbs, E. F.	Astrophys. J. <u>159</u> , 1093-1100 (1970).	absorpt.
Corliss, C. H.	J. Research Nat. Bur. Standards <u>74A</u> , 781-790 (1970).	compil.
Gabla, K. & Kunisz, M.	Acta Phys. Polon. <u>A32</u> , 391-396 (1970).	emiss., rel.
Lvov, B. V.	Optics and Spectroscopy (U.S.S.R.) <u>28</u> , 8-12 (1970).	absorpt., rel.

Cu II

Hefferlin, R., Kuhlman, H., Penz, J., & Wheeler, D.	Bull. Am. Phys. Soc. <u>16</u> , 106 (1971).	emiss., rel.
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Cu XIV

Gruzdev, P. F.	Optics and Spectroscopy (U.S.S.R.) <u>28</u> , 334-337 (1969).	quant.
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Cohen, L., Feldman, U., & J. Opt. Soc. Am. 58, 331-334 (1968). quant.
Kastner, S. O.

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Eu (Europium)

Eu I

Handrich, E., Kretzen, H., Lange, "Optical Pumping and Atomic Line Shape," 417-432 life
W., Steudel, A., Wallenstein, R., (ed. Skalinski, T., Panstwowe Wydawnictwo
& Walther, H. Naukowe, Warsaw, 1969).
Lvov, B. V. Optics and Spectroscopy (U.S.S.R.) 28, 8-12 absorpt., rel.
(1970).

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F (Fluorine)*

F I

Bengtson, R. D., Miller, M. H., Phys. Rev. A 3, 16-24 (1971). emiss.
Koopman, D. W., & Wilkerson, T. D.

F II

Westhaus, P. & Sinanoglu, O. Phys. Rev. 183, 56-68 (1969); Astrophys. J. quant.
157, 997-1005 (1969).
Nicolaidis, C. & Sinanoglu, O. Nucl. Instrum. Methods 90, 133-136 (1970). quant.

F III

Berry, H. G., Martinson, I., J. Opt. Soc. Am. 60, 1461-1462 (1970). life
Schectman, R. M., Bickel,
W. S., & Palenius, H. P.

*See also Section 3.2 for some further references.

Denis, A., Ceyzeriat, P., & Dufay, M. J. Opt. Soc. Am. 60, 1186-1191 (1970). life

F IV

Berry, H. G., Martinson, I., Schectman, R. M., Bickel, W. S., & Palenius, H. P. J. Opt. Soc. Am. 60, 1461-1462 (1970). life

Denis, A., Ceyzeriat, P., & Dufay, M. J. Opt. Soc. Am. 60, 1186-1191 (1970). life

F V

Weiss, A. W. Phys. Rev. 188, 119-130 (1969). interp.

F VI

Berry, H. G., Martinson, I., Schectman, R. M., Bickel, W. S., & Palenius, H. P. J. Opt. Soc. Am. 60, 1461-1462 (1970). life

F VII

Ali, M. A. & Schaad, L. J. J. Phys. B (Proc. Phys. Soc.) Ser. 2, 2, 1304-1308 (1969). quant.

Barrette, L., Knystautas, E. J., Neveu, B., & Drouin, R. Phys. Letters 32A, 435-436 (1970). life

Donnally, B., Smith, W. W., Pegg, D. J., Brown, M., & Sellin, I. A. Phys. Rev. A 4, 122-125 (1971). life

F VIII

Senashenko, V. S. & Teku, B. Vestnik Moskovskogo Universitet Ser. 3 fiz. i astron., 120-122 (1968). quant.

Brown, R. T. Astrophys. J. 158, 829-837 (1969). quant.

Drake, G.W.F. & Dalgarno, A. Phys. Rev. A 1, 1325-1329 (1970). quant.

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Fe (Iron)*

Fe I

Morozova, N. G., Startsev, G. P., & Frish, M. S.	Fiz. Probl. Spektroskopii, Akad. Nauk S.S.S.R., Materialy 13-Go (Trinadtsatago) Soveshch., Leningrad 45-51 (1962) (Translation in Smithsonian Astrophysical Observatory, Cambridge, Massachusetts, No. 8, 1-11, November, 1966).	emiss., rel.
Ashenfelter, R. C.	Thesis, California Institute of Technology (1967).	absorpt.
Corliss, C. H. & Tech, J. L.	J. Research Nat. Bur. Standards <u>71A</u> , 567-573 (1967).	comm.
Rudzikas, Z. B., Vizbaraite, Ya. I., Dosinas, G. I., & Yutsis, A. P.	Litovskii Fizicheski Sbornik (S.S.S.R.) <u>8</u> , 331-342 (1968).	quant.
Vizbaraite, Ya. I., Rudzikas, Z. B., Dosinas, G. I., & Yutsis, A. P.	Litovskii Fizicheski Sbornik (S.S.S.R.) <u>8</u> , 319-330 (1968).	quant.
Garz, T. & Kock, M.	Astron. Astrophys. <u>2</u> , 274-279 (1969).	emiss.
Goldman, A.	Scientific Report No. 5, Sept. (1969) AFCLR-69-0447, Univ. of Denver, Denver, Colo.	CA
Grevesse, N., & Swings, J. P.	Astron. Astrophys. <u>2</u> , 28-44 (1969).	estim. forb.
Peach, J. V.	Monthly Notices Roy. Astron. Soc. <u>144</u> , 171-177 (1969).	absorpt. rel.
Whaling, W., King, R. B. & Martinez-Garcia, M.	Astrophys. J. <u>158</u> , 389-398 (1969).	life
Bell, G. D. & Tubbs, E. F.	Astrophys. J. <u>159</u> , 1093-1100 (1970).	absorpt.
Bridges, J. M. & Wiese, W. L.	Astrophys. J. <u>161</u> , L71-L75 (1970).	emiss.
Lvov, B. V.	Optics and Spectroscopy (U.S.S.R.) <u>28</u> , 8-12 (1970).	absorpt., rel.
Richter, J., & Wulff, P.	Astron. Astrophys. <u>2</u> , 37-44 (1970).	emiss.
Smith, W. H.	Nucl. Instrum. Methods <u>90</u> , 115-119 (1970).	life
Whaling, W., Martinez-Garcia, M., Mickey, D. L., & Lawrence, G. M.	Nucl. Instrum. Methods <u>90</u> , 363-368 (1970).	emiss., rel.
Wolnik, S. J., Berthel, R. O., & Wares, G. W.	Astrophys. J. <u>162</u> , 1037-1047 (1970).	emiss.
Andersen, T. & Sørensen, G.	Astrophys. Letters <u>8</u> , 39-40 (1971).	life
Grevesse, N., Nussbaumer, H., & Swings, J. P.	Monthly Notices Roy. Astron. Soc. <u>151</u> , 239-252 (1971).	quant. forb.
Klose, J. Z.	Astrophys. J. <u>165</u> , 637-642 (1971).	life

*See also Section 3.2 for some further references.

Martinez-Garcia, M., Whaling, W.,	Astrophys. J. <u>165</u> , 213-216 (1971).	emiss.,
Mickey, D. L., & Lawrence, G. M.		rel.
Wolnik, S. J., Berthel, R. O., &	Astrophys. J. <u>166</u> , L31-L33 (1971).	emiss.
Wares, G. W.		

Fe II

Gruzdev, P. F.	Fiz. Probl. Spektroskopii, Akad. Nauk S.S.S.R., Materialy 13-Go (Trinadtsatago) Soveshch., Leningrad 36-39 (1962) (Translation in Smithsonian Astrophysical Observatory, Cambridge, Massachusetts, No. 8, 13-18, November, 1966).	quant., rel.
Bogudlov, A. M.	Akademiia Nauk S.S.S.R. Krymskaia Astrofizicheskaia Observatoriia, Izvestiia <u>37</u> , 267-272 (1967).	misc.
Rudzikas, Z. B., & Yutsis, A. P.	Litovskii Fizicheskii Sbornik <u>2</u> , 433-447 (1969).	quant. forb.
Baschek, B., Garz, T., Holweger, H., & Richter, J.	Astron. Astrophys. <u>4</u> , 229-233 (1970).	emiss.
Kuzmitskite, L. L. & Ushpalis, K. K.	Litovskii Fizicheskii Sbornik (S.S.S.R.) <u>10</u> , 59-67 (1970).	quant.
Nussbaumer, H. & Swings, J. P.	Astron. Astrophys. <u>7</u> , 455-458 (1970).	quant. forb.
Smith, P. L., Whaling, W., & Mickey, D. L.	Nucl. Instrum. Methods <u>20</u> , 47-50 (1970).	life
Wolnik, S. J., Berthel, R. O., & Wares, G. W.	Astrophys. J. <u>166</u> , L31-L33 (1971).	emiss.

Fe III

Warner, B.	Communications from the University of London Observatory, No. 66 (1965).	CA
Baker, S. C.	J. Opt. Soc. Am. <u>61</u> , 271 (1971).	emiss., rel.

Fe VII

Warner, B. & Kirkpatrick, R. C.	Monthly Notices Roy. Astron. Soc. <u>144</u> , 397-410 (1969).	quant., quant. forb.
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Fe IX

Garstang, R. H.	Publ. Astron. Soc. Pacific <u>81</u> , 488-495 (1969).	quant. forb.
Wagner, W. J. & House, L. L.	Astrophys. J. <u>166</u> , 683-698 (1971).	quant. forb.

Fe XI

Gruzdev, P. F. Optics and Spectroscopy (U.S.S.R.) 28, 334-337 (1969). quant.

Fe XII

Ali, M. A. & Joy, H. W. J. Phys. B (Atom. Molec. Phys.) 3, 1552-1557 (1970). SCF

Fe XIV

Blaha, M. Solar Phys. 17, 99-116 (1971). quant.

Fe XV

Garstang, R. H. Publ. Astron. Soc. Pacific 81, 488-495 (1969). quant. forb.

Fe XVI

McEachran, R. P., Tull, C. E. & Cohen, M. Astron. Astrophys. 4, 152-155 (1970). quant.

Fe XVII

Beigman, I. L., & Urnov, A. M. Optics and Spectroscopy (U.S.S.R.) 27, 203-204 (1969). quant., rel.

Garstang, R. H. Publ. Astron. Soc. Pacific 81, 488-495 (1969). quant. forb.

Fe XXI

Nussbaumer, H. Astrophys. J. 166, 411-422 (1971). quant. forb.

Fe XXIII

Garstang, R. H. Publ. Astron. Soc. Pacific 81, 488-495 (1969). quant. forb.

Fe XXV

Garstang, R. H. Publ. Astron. Soc. Pacific 81, 488-495 (1969). quant. forb.

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Ga (Gallium)

Ga I

- | | | |
|---|--|----------------|
| Addink, N. W. H. | "Proc. of XIV Colloquium Spectroscopicum Internationale," B1, 201-208 (Debrecen, Hungary, 1967). | comm. |
| Andersen, T., Jessen, K. A., & Sørensen, G. | Nucl. Instrum. Methods <u>90</u> , 35-39 (1970). | life |
| Lvov, B. V. | Optics and Spectroscopy (U.S.S.R.) <u>28</u> , 8-12 (1970). | absorpt., rel. |
| Norton, M. & Gallagher, A. | Phys. Rev. A <u>3</u> , 915-927 (1971). | life |

Ga V

- | | | |
|---|---|--------|
| Yutsis, A. P., Vizbaraitė, Ya. I., & Karazis, P. I. | Litovskii Fizicheskii Sbornik (S.S.S.R.) <u>8</u> , 551-564 (1968). | quant. |
|---|---|--------|

* * * * *

Ge (Germanium)

Ge I

- | | | |
|------------------|--|----------------|
| Addink, N. W. H. | "Proc. of XIV Colloquium Spectroscopicum Internationale," B1, 201-208 (Debrecen, Hungary, 1967). | comm. |
| Lvov, B. V. | Optics and Spectroscopy (U.S.S.R.) <u>28</u> , 8-12 (1970). | absorpt., rel. |

Ge VI

- | | | |
|---|---|--------|
| Yutsis, A. P., Vizbaraitė, Ya. I., & Karazis, P. I. | Litovskii Fizicheskii Sbornik (S.S.S.R.) <u>8</u> , 551-564 (1968). | quant. |
|---|---|--------|

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H (Hydrogen)

H I

Kardashev, N. S.	Soviet Astron.-AJ (U.S.S.R.) <u>3</u> , 813-820 (1959).	quant.
Bureeva, L. A.	Soviet Astron.-AJ (U.S.S.R.) <u>12</u> , 962-966 (1969).	quant.
Etherton, R. C., Beyer, L. M., Maddox, W. E., & Bridwell, L. B.	Phys. Rev. A <u>2</u> , 2177-2179 (1970).	life
Zhukovskii, V. Ch., Kolesnikova, M. M., Sokolov, A. A., & Kherrmann, I.	Optics and Spectroscopy (U.S.S.R.) <u>28</u> , 337-339 (1970).	quant. forb.
Mickish, R. A. & Fowler, R. G.	Bull. Am. Phys. Soc. (II) <u>16</u> , 205 (1971).	life

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He (Helium)*

He I

Buchhaupt, K. & Drtil, W.	Z. Naturforsch. <u>22A</u> , 2126-2127 (1967).	life
Senashenko, V. S. & Teku, B.	Vestnik Moskovskogo Universitet Ser. 3 fiz. i astron., 120-122 (1968).	quant.
Fry, E. S. & Williams, W. L.	Phys. Rev. <u>183</u> , 81-90 (1969).	life
Imhoff, R. E., & Read, F. H.	Chem. Phys. Letters <u>3</u> , 652-654 (1969).	life
Knox, H. O. & Rudge, M.R.H.	J. Phys. B (Proc. Phys. Soc.) Ser. 2, <u>2</u> , 521- 523 (1969).	quant.
Martinson, I. & Bickel, W. S.	Phys. Letters <u>30A</u> , 524-525 (1969).	life
Bridgett, K. A., King, T. A., & Smith-Saville, R. J.	J. Phys. E (Sci. Instrum.) <u>3</u> , 767-774 (1970).	life
Cameron, S., & McEachran, R. P., & Cohen, M.	Can. J. Phys. <u>48</u> , 211-215 (1970).	quant.
Chin-Bing, S. A. & Head, C. E.	Bull. Am. Phys. Soc. II, <u>15</u> , 1375 (1970).	life
Chin-Bing, S. A., Head, C. E., & Green, Jr., A. E.	Am. J. Phys. <u>38</u> , 352-359 (1970).	life
Dickinson, H. O., & Rudge, M.R.H.	J. Phys. B (Proc. Phys. Soc.) <u>3</u> , 1284-1285 (1970).	quant.
Drake, G.W.F.	Phys. Rev. Letters <u>24</u> , 765-767 (1970).	quant.

*See also Section 3.2 for some further references.

Drake, G.W.F. & Dalgarno, A.	Phys. Rev. A <u>1</u> , 1325-1329 (1970).	quant.
Imhof, R. E. & Read, F. H.	Nucl. Instrum. Methods <u>90</u> , 109-113 (1970).	life
Martinson, I., Bickel, W. S., Bromander, J., Berry, H. G., Lundin, L., Buchta, R., & Bergström, I.	J. Opt. Soc. Am. <u>60</u> , 352-353 (1970).	life
Pearl, A. S.	Phys. Rev. Letters <u>24</u> , 703-705 (1970).	life
Van Dyck, Jr., R. S., Johnson, C. E., & Shugart, H. A.	Phys. Rev. Letters <u>25</u> , 1403-1405 (1970).	life
Arrathoon, R.	J. Opt. Soc. Am. <u>61</u> , 332-334 (1971).	absorpt., rel.
Berry, H. G., Martinson, I., Curtis, L. J. & Lundin, L.	Phys. Rev. A <u>3</u> , 1934-1937 (1971).	life
Briggs, J. S. & Kim, Y. K.	Phys. Rev. A <u>3</u> , 1342-1348 (1971).	quant.
Burger, J. M. & Lurio, A.	Phys. Rev. A <u>3</u> , 64-75 (1971).	life
De Jongh, J. P. & Van Eck, J.	Physica <u>51</u> , 104-112 (1971).	absorpt.

He II

Dotchin, L. W., Pegg, D. J. & Chupp, E. L.	Phys. Letters <u>31A</u> , 85-86 (1970).	life
Lundin, L., Oona, H., Bickel, W. S., & Martinson, I.	Physica Scripta <u>2</u> , 213-215 (1970).	life

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Hg (Mercury)

Hg I

Addink, N. W. H.	"Proc. of XIV Colloquium Spectroscopicum Internationale," B1, 201-208 (Debrecen, Hungary, 1967).	comm.
Bieniewski, T. M., Krueger, T. K., & Czyzak, S. J.	Ad. Quant. Chem. <u>4</u> , 141-152 (1968).	absorpt., SCF
Andersen, T., Jessen, K. A., & Sørensen, G.	Nucl. Instrum. Methods <u>90</u> , 35-39 (1970).	life
Camhy-Val, C., Dumont, A. M., Druex, M., & Vitry, R.	Phys. Letters <u>32A</u> , 233-234 (1970).	life

Lincke, R., & Stredede, B.
Deech, J. S. & Baylis, W. E.

Z. Physik 238, 164-171 (1970).
Can. J. Phys. 49, 90-101 (1971).

absorpt.
life

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I (Iodine)

I II

Gruzdev, P. F.

Optics and Spectroscopy (U.S.S.R.) 27, 479-481
(1969).

quant.

* * * * *

In (Indium)

In I

Addink, N. W. H.

"Proc. of XIV Colloquium Spectroscopicum
Internationale," B1, 201-208 (Debrecen,
Hungary, 1967).

comm.

Andersen, T., Jessen, K. A., &
Sørensen, G.

Nucl. Instrum. Methods 90, 35-39 (1970).

life

Norton, M. & Gallagher, A.

Phys. Rev. A 3, 915-927 (1971).

life

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K (Potassium)*

K I

Nanda, J. N.

Indian J. Phys. 19, 1-7 (1945).

quant., SCF

Nanda, J. N.

Indian J. Phys. 19, 8-19 (1945).

absorpt.,
rel.

*See also Section 3.2 for some further references.

Gridneva, S. M., & Kasabov, G. A.	"Magnitogidro-dinamicheskii Method Poluchenia Elektroenergii," 303-306 (eds. Kirillina, V. A. & Sheindlina, A. E. Moscow, 1968).	emiss.
Goldman, A.	Scientific Report No. 5, Sept. (1969) AFCRL-69-0447, Univ. of Denver, Denver, Colo.	CA
Mazing, M. A. & Serapinas, P. D.	Optics and Spectroscopy (U.S.S.R.) <u>26</u> , 483-484 (1969).	hook, rel. & absorpt.
Beigman, I. L., Vainshtein, L. A. & Shevelko, V. P.	Optics and Spectroscopy (U.S.S.R.) <u>28</u> , 229-231 (1970).	quant.

K II

Andersen, T., Desesquelles, J., Jessen, K. A., & Sørensen, G.	J. Opt. Soc. Am. <u>60</u> , 1199-1203 (1970).	life
Berry, H. G., Bromander, J., & Buchta, R.	Phys. Scripta <u>1</u> , 179-180 (1970).	life
Bromander, J., Berry, H. G., & Buchta, R.	Nucl. Instrum. Methods <u>90</u> , 55-58 (1970).	life

K III

Andersen, T., Desesquelles, J., Jessen, K. A., & Sorensen, G.	J. Opt. Soc. Am. <u>60</u> , 1199-1203 (1970).	life
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K IV

Gruzdev, P. F.	Optics and Spectroscopy (U.S.S.R.) <u>28</u> , 334-337 (1969).	quant.
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K V

Ali, M. A. & Joy, H. W.	J. Phys. B (Atom. Molec. Phys.) <u>3</u> , 1552-1557 (1970).	SCF
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Kr (Krypton)

Kr I

Griffin, P. M. & Hutcherson, J. W.	J. Opt. Soc. Am. <u>59</u> , 1607-1613 (1969); and <u>61</u> , 136 (1971).	absorpt., comm.
Aymar, M., Feneuille, S., & Klapisch, M.	Nucl. Instrum. Methods <u>90</u> , 137-143 (1970).	quant.
Geiger, J.	Phys. Letters <u>33A</u> , 351-352 (1970).	misc.
De Jongh, J. P. & Van Eck, J.	Physica <u>51</u> , 104-112 (1971).	absorpt.
Dobrin, R. & Landman, D.	Bull. Am. Phys. Soc. <u>16</u> , 106 (1971).	life

Kr II

Koozekanani, S. H., & Trusty, G. L.	J. Opt. Soc. Am. <u>59</u> , 1281-1284 (1969).	quant.
Fink, U., Bashkin, S., & Bickel, W. S.	J. Quant. Spectrosc. Radiat. Transfer <u>10</u> , 1241- 1256 (1970).	life

Kr III

Gruzdev, P. F.	Optics and Spectroscopy (U.S.S.R.) <u>27</u> , 479-481 (1969).	quant.
Fink, U., Bashkin, S., & Bickel, W. S.	J. Quant. Spectrosc. Radiat. Transfer <u>10</u> , 1241- 1256 (1970).	life

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La (Lanthanum)

La I

Hese, A.	Z. Physik <u>236</u> , 42-51 (1970).	life
Hese, A. & Buldt, G.	Z. Naturforsch. <u>25a</u> , 1537-1545 (1970).	life
Hese, A. & Weise, H. P.	Z. Angew. Phys. <u>30</u> , 170-174 (1970).	life

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Li (Lithium)*

Li I

- Brog, K. C., Eck, T. G. & Wieder, H. Phys. Rev. 153, 91-103 (1967). life
- All, M. A. & Schaad, L. J. J. Phys. B (Proc. Phys. Soc.) Ser. 2, 2, 1304-1308 (1969). quant.
- Gaillard, F., Gaillard, M., Desesquelles, J. & Dufay, M. Comp. rend. 269B, 420-422 (1969). life
- Isler, R. C., Marcus, S. & Novick, R. Phys. Rev. 187, 76-84 (1969). life
- Veselov, M. G. & Shtoff, A. V. Optics and Spectroscopy (U.S.S.R.) 26, 177 (1969). quant.
- Beigman, I. L., Vainshtein, I. A. & Shevelko, V. P. Optics and Spectroscopy (U.S.S.R.) 28, 229-231 (1970). quant.
- Martinson, I. Nucl. Instrum. Methods 90, 81-84 (1970). life
- Levitt, M., Novick, R., & Feldman, P. D. Phys. Rev. A 3, 130-146 (1971). life

Li II

- Senashenko, V. S. & Teku, B. Vestnik Moskovskogo Universitet Ser. 3 fiz. i astron., 120-122 (1968). quant.
- Brown, R. T. Astrophys. J. 158, 829-837 (1969). quant.
- Gaillard, F., Gaillard, M., Desesquelles, J. & Dufay, M. Comp. rend. 269B, 420-422 (1969). life
- Bromander, J. & Buchta, R. Phys. Scripta. 1, 184-185 (1970). life
- Drake, G.W.F. & Daigarno, A. Phys. Rev. A 1, 1325-1329 (1970). quant.

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Lu (Lutetium)

Lu I

- Göbel, L. H. Z. Naturforsch. 26A, 611-620 (1970). life

*See also Section 3.2 for some further references.

* * * * *

Mg (Magnesium)*

Mg I

Addink, N. W. H.	"Proc. of XIV Colloquium Spectroscopicum Internationale," B1, 201-208 (Debrecen, Hungary, 1967).	comm.
Goldman, A.	Scientific Report No. 5, Sept. (1969) AFCRL-69-0447, Univ. of Denver, Denver, Colo.	CA
Andersen, T., Desesquelles, J., Jessen, K. A., & Sørensen, G.	J. Quant. Spectrosc. Radiat. Transfer <u>10</u> , 1143-1150 (1970).	life
Andersen, T., Jessen, K. A., & Sørensen, G.	Nucl. Instrum. Methods <u>90</u> , 35-39 (1970).	life
Berry, H. G., Bromander, J., & Buchta, R.	Phys. Scripta <u>1</u> , 181-183 (1970).	life
Bromander, J., Berry, H. G., & Buchta, R.	Nucl. Instrum. Methods <u>90</u> , 55-58 (1970).	life
Smith, W. H.	Nucl. Instrum. Methods <u>90</u> , 115-119 (1970).	life
Lincke, R. & Ziegenbein, B.	Z. Physik <u>241</u> , 369-379 (1971).	emiss., rel.
Schaefer, A. R.	Astrophys. J. <u>162</u> , 411-416 (1971).	life

Mg II

Goldman, A.	Scientific Report No. 5, Sept. (1969) AFCRL-69-0447, Univ. of Denver, Denver, Colo.	CA
Andersen, T., Desesquelles, J., Jessen, K. A., & Sørensen, G.	J. Quant. Spectrosc. Radiat. Transfer <u>10</u> , 1143-1150 (1970).	life
Berry, H. G., Bromander, J., & Buchta, R.	Phys. Scripta <u>1</u> , 181-183 (1970).	life
Bromander, J., Berry, H. G., & Buchta, R.	Nucl. Instrum. Methods <u>90</u> , 55-58 (1970).	life
Smith, W. H.	Nucl. Instrum. Methods <u>90</u> , 115-119 (1970).	life
Schaefer, A. R.	Astrophys. J. <u>162</u> , 411-416 (1971).	life

*See also Section 3.2 for some further references.

Mg III

Andersen, T., Desesquelles, J.,
Jessen, K. A., & Sørensen, G. Phys. Rev. A 1, 1294-1298 (1970). life

Mg VII

Nussbaumer, H. Astrophys. J. 166, 411-422 (1971). quant. forb.

Mg VIII

Weiss, A. W. Phys. Rev. 188, 119-130 (1969). interp.

Mg XI

Brown, R. T. Astrophys. J. 158, 829-837 (1969). quant.

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Mn (Manganese)*

Mn I

Addink, N. W. H. "Proc. of XIV Colloquium Spectroscopicum
Internationale," B1, 201-208 (Debrecen,
Hungary, 1967). comm.

Mn VI

Warner, B. & Kirkpatrick, R. C. Monthly Notices Roy. Astron. Soc. 144, 397-410
(1969). quant.,
quant. forb.

Mn X

Gruzdev, P. F. Optics and Spectroscopy (U.S.S.R.) 28, 334-337
(1969). quant.

*See also Section 3.2 for some further references.

Mn XI

- Ali, M. A. & Joy, H. W. J. Phys. B (Atom. Molec. Phys.) 3, 1552-1557 (1970). SCF
(1970).

Mn XVII

- Cohen, L., Feldman, U., & J. Opt. Soc. Am. 58, 331-334 (1968). quant.
Kastner, S. O.

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Mo (Molybdenum)

Mo I

- Addink, N. W. H. "Proc. of XIV Colloquium Spectroscopicum comm.
Internationale," B1, 201-208 (Debrecen,
Hungary, 1967).

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N (Nitrogen)*

N I

- Wilson, K. H., & Nicolet, W. E. J. Quant. Spectrosc. Radiat. Transfer 7, 891-941 SCF, compil.
(1967).
- Kobzev, G. A. & Sergeev, V. M. Teplofizika Vysokikh Temperatur 7, 1012-1014 quant.
(1969).
- Morris, J. C. & Garrison, R. L. Phys. Rev. 188, 112-118 (1969). emiss.
- Westhaus, P. & Sinanoglu, O. Phys. Rev. 183, 56-68 (1969); Astrophys. J. quant.
152, 997-1005 (1969).
- Desesquelles, J. Thesis L'Universite de Lyon (1970). life
- Lin, C.-L., Parkes, D. A., & J. Chem. Phys. 53, 3896-3900 (1970). absorpt.
Kaufman, F.

*See also Section 3.2 for some further references.

Nicolaidis, C. & Sinanoglu, O.	Nucl. Instrum. Methods <u>90</u> , 133-136 (1970).	quant.
Smith, W. H., Bromander, J., Curtis, L. J., & Buchta, R.	Physica Scripta <u>2</u> , 211-212 (1970).	life
Hutchison, R. B.	J. Quant. Spectrosc. Radiat. Transfer <u>11</u> , 81-91 (1971).	life

N II

Wilson, K. H., & Nicolet, W. E.	J. Quant. Spectrosc. Radiat. Transfer <u>7</u> , 891-941 (1967).	SCF, compil.
Bashkin, S., Berry, H. G., Bickel, W. S. & Desesquelles, J.	Comp. rend. <u>269B</u> , 63-65 (1969).	life
Kobzev, G. A. & Sergeev, V. M.	Teplofizika Vysokikh Temperatur <u>7</u> , 1012-1014 (1969).	quant.
Sinanoglu, O.	"Atomic Physics," 131-160 (Plenum Press, New York, 1969).	quant.
Westhaus, P. & Sinanoglu, O.	Phys. Rev. <u>183</u> , 56-68 (1969); Astrophys. J. <u>157</u> , 997-1005 (1969).	quant.
Zavenyagin, Yu. A. & Dontsov, Yu, P.	Optics and Spectroscopy (U.S.S.R.) <u>26</u> , 82-83 (1969).	emiss., rel.
Desesquelles, J.	Thesis L'Universite de Lyon (1970).	life
Kernahan, J. A., Pinnington, E. H., & Lin, C. C.	Phys. Letters <u>32A</u> , 350-351 (1970).	life
Nicolaidis, C., & Sinanoglu, O.	Phys. Letters <u>33A</u> , 178-179 (1970).	quant.
Nicolaidis, C. & Sinanoglu, O.	Nucl. Instrum. Methods <u>90</u> , 133-136 (1970).	quant.
Pinnington, E. H.	Nucl. Instrum. Methods <u>90</u> , 93-102 (1970).	life
Smith, W. H., Bromander, J., Curtis, L. J., & Buchta, R.	Physica Scripta <u>2</u> , 211-212 (1970).	life
Hutchison, R. B.	J. Quant. Spectrosc. Radiat. Transfer <u>11</u> , 81-91 (1971).	life
McCrocklin, W. B., Jr. & Head, C. E.	J. Opt. Soc. Am. <u>61</u> , 619-625 (1971).	life
Nussbaumer, H.	Astrophys. J. <u>166</u> , 411-422 (1971).	quant. forb.

N III

Bashkin, S., Berry, H. G., Bickel, W. S. & Desesquelles, J.	Comp. rend. <u>269B</u> , 63-65 (1969).	life
Kobzev, G. A. & Sergeev, V. M.	Teplofizika Vysokikh Temperatur <u>7</u> , 1012-1014 (1969).	quant.
Sinanoglu, O.	"Atomic Physics," 131-160 (Plenum Press, New York, 1969).	quant.

Weiss, A. W.	Phys. Rev. <u>188</u> , 119-130 (1969).	interp.
Westhaus, P. & Sinanoglu, O.	Phys. Rev. <u>183</u> , 56-68 (1969); Astrophys. J. <u>157</u> , 997-1005 (1969).	quant.
Desesquelles, J.	Thesis L'Universite de Lyon (1970).	life
Kernahan, J. A., Pinnington, E. H., & Lin, C. C.	Phys. Letters <u>32A</u> , 350-351 (1970).	life
Nicolaidis, C. & Sinanoglu, O.	Nucl. Instrum. Methods <u>90</u> , 133-136 (1970).	quant.
Pinnington, E. H.	Nucl. Instrum. Methods <u>90</u> , 93-102 (1970).	life
Ceyzeriat, P., Denis, A., Desesquelles, J., Druetta, M., & Poulizac, M. C.	Nucl. Instrum. Methods <u>90</u> , 103-108 (1970).	life
Hutchison, R. B.	J. Quant. Spectrosc. Radiat. Transfer <u>11</u> , 81-91 (1971).	life

N IV

Druetta, M.	Comp. rend. <u>269B</u> , 1154-1156 (1969).	life
Nussbaumer, H.	Monthly Notices Roy. Astron. Soc. <u>145</u> , 141-150 (1969); NBS Special Publ. #332, 61-64 (1970).	quant.
Desesquelles, J.	Thesis L'Universite de Lyon (1970).	life
Kernahan, J. A., Pinnington, E. H., & Lin, C. C.	Phys. Letters <u>32A</u> , 350-351 (1970).	life
Ceyzeriat, P., Denis, A., Desesquelles, J., Druetta, M., & Poulizac, M. C.	Nucl. Instrum. Methods <u>90</u> , 103-108 (1970).	life

N V

Ali, M. A. & Schaad, L. J.	J. Phys. B (Proc. Phys. Soc.) Ser. 2, <u>2</u> , 1304-1308 (1969).	quant.
Bickel, W. S., Berry, H. G., Desesquelles, J. & Bashkin, S.	J. Quant. Spectrosc. Radiat. Transfer <u>2</u> , 1145-1149 (1969).	life
Barrette, L., Knystautas, E. J., Neveu, B., & Drouin, R.	Phys. Letters <u>32A</u> , 435-436 (1970).	life
Desesquelles, J.	Thesis L'Universite de Lyon (1970).	life
Dufay, M., Denis, A., & Desesquelles, J.	Nucl. Instrum. Methods <u>90</u> , 85-91 (1970).	life

N VI

Senashenko, V. S. & Teku, B.	Vestnik Moskovskogo Universitet Ser. 3 fiz. i astron., 120-122 (1968).	quant.
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Brown, R. T.	Astrophys. J. <u>158</u> , 829-837 (1969).	quant.
Drake, G.W.F. & Dalgarno, A.	Phys. Rev. A <u>1</u> , 1325-1329 (1970).	quant.
Dufay, M., Denis, A., & Desesquelles, J.	Nucl. Instrum. Methods <u>90</u> , 85-91 (1970).	life

N VII

Dufay, M., Denis, A., & Desesquelles, J.	Nucl. Instrum. Methods <u>90</u> , 85-91 (1970).	life
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Na (Sodium)*

Na I

Schönberner, D. & Zimmerman, D.	Z. Physik <u>216</u> , 172-182 (1968).	life
Goldman, A.	Scientific Report No. 5, Sept. (1969) AFCRL- 69-0447, Univ. of Denver, Denver, Colo.	CA
Andersen, T., Desesquelles, J., Jessen, K. A., & Sørensen, G.	J. Opt. Soc. Am. <u>60</u> , 1199-1203 (1970).	life
Andersen, T., Jessen, K. A., & Sørensen, G.	Nucl. Instrum. Methods <u>90</u> , 35-39 (1970).	life
Berry, H. G., Bromander, J., & Buchta, R.	Phys. Scripta <u>1</u> , 181-183 (1970).	life
Bromander, J., Berry, H. G., & Buchta, R.	Nucl. Instrum. Methods <u>90</u> , 55-58 (1970).	life
Mashinskii, A. L.	Optics and Spectroscopy (U.S.S.R.) <u>28</u> , 1-6 (1970).	life
Mashinskii, A. L. & Chaika, M. P.	Optics and Spectroscopy (U.S.S.R.) <u>28</u> , 589-593 (1970).	life
Schmieder, R. W., Lurio, A., Happer, W., & Khadjavi, A.	Phys. Rev. A <u>2</u> , 1216-1228 (1970).	life
Tudorache, S. T.	Revue Roumaine de Physique <u>15</u> , 269-270 (1970).	life

Na II

Andersen, T., Desesquelles, J., Jessen, K. A., & Sørensen, G.	Phys. Rev. A <u>1</u> , 1294-1298 (1970).	life
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*See also Section 3.2 for some further references.

Andersen, T., Desesquelles, J., Jessen, K. A., & Spørensen, G.	J. Opt. Soc. Am. <u>60</u> , 1199-1203 (1970).	life
Carre, M., Gaillard, M. L., & Subtil, J. L.	Nucl. Instrum. Methods <u>90</u> , 217-222 (1970).	life
Crance, M.	Comp. rend. <u>271</u> , 1089-1092 (1970).	quant.
Dufay, M., Gaillard, M. & Carre, M.	Phys. Rev. A <u>2</u> , 1367-1375 (1971).	life

Na III

Westhaus, P. & Sinanoglu, O.	Phys. Rev. <u>183</u> , 56-68 (1969).	quant.
Andersen, T., Desesquelles, J., Jessen, K. A., & Spørensen, G.	J. Opt. Soc. Am. <u>60</u> , 1199-1203 (1970).	life
Dufay, M., Gaillard, M. & Carre, M.	Phys. Rev. A <u>3</u> , 1367-1375 (1971).	life

Na IV

Gaillard, M., Ceyzeriat, P., Denis, A. & Dufay, M.	Comp. rend. <u>269B</u> , 526-528 (1969).	life
Dufay, M., Gaillard, M. & Carre, M.	Phys. Rev. A <u>3</u> , 1367-1375 (1971).	life

Na VI

Nussbaumer, H.	Astrophys. J. <u>166</u> , 411-422 (1971).	quant. forb.
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Na VII

Weiss, A. W.	Phys. Rev. <u>188</u> , 119-130 (1969).	interp.
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Na X

Brown, R. T.	Astrophys. J. <u>158</u> , 829-837 (1969).	quant.
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Nd (Neodymium)

Nd II

Tech, J. L.

NBS Monograph 119 (U. S. Government Printing Office, comm.
Washington, D. C., 1971).

* * * * *

Ne (Neon)*

Ne I

Rudzikas, Z. B., Vizbaraitė, Ya. I., & Yutsis, A. P.	Litovskii Fizicheskii Sbornik (S.S.S.R.) <u>5</u> , 63-69 (1965).	quant.
Chenevier, M. & Gouillet, G.	J. Physique Suppl. C1, <u>30</u> , 84-88 (1969).	life
Klose, J. Z.	Phys. Rev. <u>188</u> , 45-49 (1969).	life
Kotlikov, E., & Chaika, M.	Optics and Spectroscopy (U.S.S.R.) <u>27</u> , 281-282 (1969).	life
Mehlhorn, R.	J. Opt. Soc. Am. <u>59</u> , 1453-1454 (1969).	quant.
Assoua, G. E., Brown, L., & Ford, Jr., W. K.	J. Opt. Soc. Am. <u>60</u> , 1311-1314 (1970).	life
Aymar, M., Feneuille, S., & Klapisch, M.	Nucl. Instrum. Methods <u>90</u> , 137-143 (1970).	quant.
Bengtson, R. D., & Miller, M. H.	J. Opt. Soc. Am. <u>60</u> , 1093-1096 (1970).	emiss.
Bridges, J. M., & Wiese, W. L.	Phys. Rev. <u>2</u> , 285-293 (1970).	emiss.
Feneuille, S., Klapisch, M., Koenig, E., & Liberman, S.	Physica <u>48</u> , 571-588 (1970).	quant.
Geiger, J.	Phys. Letters <u>33A</u> , 351-352 (1970).	misc.
Ivanov, E. I. & Chaika, M. P.	Optics and Spectroscopy (U.S.S.R.) <u>29</u> , 335-338 (1970).	life
Lawrence, T. N. & Head, C. E.	Bull. Am. Phys. Soc. II, <u>15</u> , 1375 (1970).	life
Semyonov, R. L.	Optics and Spectroscopy (U.S.S.R.) <u>28</u> , 341-344 (1970).	quant.
Sharpton, F. A., St. John, R. M., Lin, C. C. & Fajen, F. E.	Phys. Rev. A <u>2</u> , 1305-1322 (1970).	quant.
Shoffstall, D. R. & Ellis, D. G.	J. Opt. Soc. Am. <u>60</u> , 894-897 (1970).	emiss., rel. & quant., rel.

*See also Section 3.2 for some further references.

De Jongh, J. P. & Van Eck, J.	Physica <u>51</u> , 104-112 (1971).	absorpt.
Koenig, E.	Phys. Letters <u>34A</u> , 284-286 (1971).	quant.
Liu, C. H., Bashkin, S., & Bickel, W. S.	Phys. Rev. Letters <u>26</u> , 222-224 (1971).	life

Ne II

Denis, A., Desesquelles, J. & Dufay, M.	J. Opt. Soc. Am. <u>59</u> , 976-980 (1969).	life
Koozekanani, S. H., & Trusty, G. L.	J. Opt. Soc. Am. <u>59</u> , 1281-1284 (1969).	quant.
Westhaus, P. & Sinanoglu, O.	Phys. Rev. <u>183</u> , 56-68 (1969); Astrophys. J. <u>157</u> , 997-1005 (1969).	quant.
Brand, J. H., Cocke, C. L., Curnutte, B., & Swenson, C.	Nucl. Instrum. Methods <u>90</u> , 63-70 (1970).	life
Denis, A., Ceyzeriat, P., & Dufay, M.	J. Opt. Soc. Am. <u>60</u> , 1186-1191 (1970).	life
Fink, U., Bashkin, S., & Bickel, W. S.	J. Quant. Spectrosc. Radiat. Transfer <u>10</u> , 1241- 1256 (1970).	life
Head, C. E. & Head, M. E. M.	Phys. Rev. A <u>2</u> , 2244-2250 (1970).	life
Hodges, D., Marantz, H. & Tang, C. L.	J. Opt. Soc. Am. <u>60</u> , 192-199 (1970).	emiss.
Luyken, B. F. J.	Nucl. Instrum. Methods <u>90</u> , 145-147 (1970).	quant.
Nicolaidis, C. & Sinanoglu, O.	Nucl. Instrum. Methods <u>90</u> , 133-136 (1970).	quant.
Persson, W.	J. Opt. Soc. Am. <u>60</u> , 1266-1267 (1970).	comm.
Luyken, B. F. J.	Physica <u>51</u> , 445-460 (1971).	quant.

Ne III

Denis, A., Desesquelles, J. & Dufay, M.	J. Opt. Soc. Am. <u>59</u> , 976-980 (1969).	life
Denis, A., Ceyzeriat, P., & Dufay, M.	J. Opt. Soc. Am. <u>60</u> , 1186-1191 (1970).	life
Fink, U., Bashkin, S., & Bickel, W. S.	J. Quant. Spectrosc. Radiat. Transfer <u>10</u> , 1241- 1256 (1970).	life

Ne IV

Denis, A., Ceyzeriat, P., & Dufay, M.	J. Opt. Soc. Am. <u>60</u> , 1186-1191 (1970).	life
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Ne V

Denis, A., Ceyzeriat, P., & Dufay, M.	J. Opt. Soc. Am. <u>60</u> , 1186-1191 (1970).	life
Nussbaumer, H.	Astrophys. J. <u>166</u> , 411-422 (1971).	quant. forb.

Ne VI

Weiss, A. W.	Phys. Rev. <u>188</u> , 119-130 (1969).	interp.
Denis, A., Ceyzeriat, P., & Dufay, M.	J. Opt. Soc. Am. <u>60</u> , 1186-1191 (1970).	life
Ceyzeriat, P., Denis, A., Desesquelles, J., Druetta, M., & Poulizac, M. C.	Nucl. Instrum. Methods <u>90</u> , 103-108 (1970).	life

Ne VIII

Barrette, L., Knystautas, E. J., Neveu, B., & Drouin, R.	Nucl. Instrum. Methods <u>90</u> , 59-61 (1970).	life
Dufay, M., Denis, A., & Desesquelles, J.	Nucl. Instrum. Methods <u>90</u> , 85-91 (1970).	life
Knystautas, E. J., Barrette, L., Neveu, B. & Drouin, R.	J. Quant. Spectrosc. Radiat. Transfer <u>11</u> , 75-79 (1971).	life

Ne IX

Senashenko, V. S. & Teku, B.	Vestnik Moskovskogo Universitet Ser. 3 fiz. i astron., 120-122 (1968).	quant.
Brown, R. T.	Astrophys. J. <u>158</u> , 829-837 (1969).	quant.
Dalgarno, A., & Drake, G. W. F.	Mem. de la Societe Royale des Sciences de Liege 5th Series <u>17</u> , 69-77 (1969).	quant. forb.
Garstang, R. H.	Publ. Astron. Soc. Pacific <u>81</u> , 488-495 (1969).	quant. forb.
Drake, G.W.F. & Dalgarno, A.	Phys. Rev. A <u>1</u> , 1325-1329 (1970).	quant.
Dufay, M., Denis, A., & Desesquelles, J.	Nucl. Instrum. Methods <u>90</u> , 85-91 (1970).	life

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Ni I

- Addink, N. W. H. "Proc. of XIV Colloquium Spectroscopicum Internationale," B1, 201-208 (Debrecen, Hungary, 1967). comm.
- Garz, T., Heise, H., & Richter, J. Astron. Astrophys. 2, 296-300 (1970). emiss., rel.
- Laurent, J., & Weniger, S. J. Quant. Spectrosc. Radiat. Transfer 10, 315-334 (1970). absorpt. rel.

Ni II

- Kuzmitskite, L. & Ushpalis, K. Litovskii Fizicheskii Sbornik (S.S.S.R.) 2, 867-880 (1969). quant.

Ni III

- Rudzikas, Z. B., Vizbaraitė, Ya. I., Dosinas, G. I., & Yutsis, A. P. Litovskii Fizicheskii Sbornik (S.S.S.R.) 8, 331-342 (1968). quant.
- Vizbaraitė, Ya. I., Rudzikas, Z. B., Dosinas, G. I., & Yutsis, A. P. Litovskii Fizicheskii Sbornik (S.S.S.R.) 8, 319-330 (1968). quant.

Ni IV

- Rudzikas, Z. B., & Yutsis, A. P. Litovskii Fizicheskii Sbornik 2, 433-447 (1969). quant. forb.

Ni IX

- Warner, B. & Kirkpatrick, R. C. Monthly Notices Roy. Astron. Soc. 144, 397-410 (1969). quant., quant. forb.

Ni XI

- Wagner, W. J. & House, L. L. Astrophys. J. 166, 683-698 (1971). quant. forb.

Ni XIII

- Gruzdev, P. F. Optics and Spectroscopy (U.S.S.R.) 28, 334-337 (1969). quant.

*See also Section 3.2 for some further references.

McEachran, R. P., Tull, C. E. & Cohen, M.	Astron. Astrophys. <u>4</u> , 152-155 (1970).	quant.
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O (Oxygen)*

O I

Wilson, K. H., & Nicolet, W. E.	J. Quant. Spectrosc. Radiat. Transfer <u>7</u> , 891-941 (1967).	SCF, compil.
Goly, A.	Acta Phys. Polon <u>36</u> , 33-39 (1969).	emiss.
Kobzev, G. A. & Sergeev, V. M.	Teplofizika Vysokikh Temperatur <u>7</u> , 1012-1014 (1969).	quant.
McConkey, J. W. & Kernahan, J. A.	Planet. Space Sci. <u>17</u> , 1297-1306 (1969).	emiss. forb.
Morris, J. C. & Garrison, R. L.	Phys. Rev. <u>188</u> , 112-118 (1969).	emiss.
Druetta, M., & Poulizac, M. C.	Phys. Letters <u>33A</u> , 115-116 (1970).	life
Lawrence, G. M.	Phys. Rev. <u>A2</u> , 397-407 (1970).	life
Lin, C.-L., Parkes, D. A., & Kaufman, P.	J. Chem. Phys. <u>53</u> , 3896-3900 (1970).	absorpt.
Martinson, I.	Nucl. Instrum. Methods <u>90</u> , 81-84 (1970).	life
van Rensbergen, W.	Solar Phys. <u>11</u> , 11-16 (1970).	quant.
Copeland, G. E.	J. Chem. Phys. <u>54</u> , 3482-3484 (1971).	life
Hutchison, R. B.	J. Quant. Spectrosc. Radiat. Transfer <u>11</u> , 81-91 (1971).	life
Kikuchi, T. T.	Appl. Opt. <u>10</u> , 1288-1295 (1971).	absorpt.
Martinson, I., Berry, H. G., Eickel, W. S., & Oona, H.	J. Opt. Soc. Am. <u>61</u> , 519-523 (1971).	life
Ott, W. R.	Phys. Rev. A <u>4</u> , 245-251 (1971).	emiss.
Smith, W. H., Bromander, J., Curtis, L. J., Berry, H. G., & Buchta, R.	Astrophys. J. <u>165</u> , 217-221 (1971).	life

O II

Wilson, K. H., & Nicolet, W. E.	J. Quant. Spectrosc. Radiat. Transfer <u>7</u> , 891-941 (1967).	SCF, compil.
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*See also Section 3.2 for some further references.

Druetta, M., & Poulizac, M.	Phys. Letters <u>29A</u> , 651-652 (1969).	life
Kobzev, G. A. & Sergeev, V. M.	Teplofizika Vysokikh Temperatur <u>7</u> , 1012-1014 (1969).	quant.
Westhaus, P. & Sinanoglu, O.	Phys. Rev. <u>183</u> , 56-68 (1969); Astrophys. J. <u>157</u> , 997-1005 (1969).	quant.
Kernahan, J. A., Lin, C. C. & Pinnington, E. H.	J. Opt. Soc. Am. <u>60</u> , 986-987 (1970).	life
Lawrence, G. M.	Phys. Rev. <u>A2</u> , 397-407 (1970).	life
Nicolaidis, C. & Sinanoglu, O.	Nucl. Instrum. Methods <u>90</u> , 133-136 (1970).	quant.
Pinnington, E. H.	Nucl. Instrum. Methods <u>90</u> , 93-102 (1970).	life
Pinnington, E. H., Kernahan, J. A. & Lin, C. C.	Astrophys. J. <u>161</u> , 339-342 (1970).	life
Copeland, G. E.	J. Chem. Phys. <u>54</u> , 3482-3484 (1971).	life
Druetta, M., Poulizac, M. C. & Dufay, M.	J. Opt. Soc. Am. <u>61</u> , 515-518 (1971).	life
Martinson, I., Berry, H. G., Bickel, W. S., & Oona, H.	J. Opt. Soc. Am. <u>61</u> , 519-523 (1971).	life
Smith, W. H., Bromander, J., Curtis, L. J., Berry, H. G., & Buchta, R.	Astrophys. J. <u>165</u> , 217-221 (1971).	life

0 III

Druetta, M., & Poulizac, M.	Phys. Letters <u>29A</u> , 651-652 (1969).	life
Kobzev, G. A. & Sergeev, V. M.	Teplofizika Vysokikh Temperatur <u>7</u> , 1012-1014 (1969).	quant.
Nussbaumer, H.	Astrophys. Letters <u>4</u> , 183-186 (1969).	quant.
Sinanoglu, O.	"Atomic Physics," 131-160 (Plenum Press, New York, 1969).	quant.
Westhaus, P. & Sinanoglu, O.	Phys. Rev. <u>183</u> , 56-68 (1969); Astrophys. J. <u>157</u> , 997-1005 (1969).	quant.
Berry, H. G., Bickel, W. S., Martinson, I., Weymann, R. J. & Williams, R. E.	Astrophys. Letters <u>5</u> , 81-83 (1970).	life
Kernahan, J. A., Lin, C. C. & Pinnington, E. H.	J. Opt. Soc. Am. <u>60</u> , 986-987 (1970).	life
Nicolaidis, C., & Sinanoglu, O.	Phys. Letters <u>33A</u> , 178-179 (1970).	quant.
Nicolaidis, C. & Sinanoglu, O.	Nucl. Instrum. Methods <u>90</u> , 133-136 (1970).	quant.
Pinnington, E. H.	Nucl. Instrum. Methods <u>90</u> , 93-102 (1970).	life
Pinnington, E. H., Kernahan, J. A. & Lin, C. C.	Astrophys. J. <u>161</u> , 339-342 (1970).	life

Druetta, M., Poulizac, M. C. & Dufay, M.	J. Opt. Soc. Am. <u>61</u> , 515-518 (1971).	life
Martinson, I., Berry, H. G., Bickel, W. S., & Oona, H.	J. Opt. Soc. Am. <u>61</u> , 519-523 (1971).	life
Nussbaumer, H.	Astrophys. J. <u>166</u> , 411-422 (1971).	quant. forl

0 IV

Druetta, M.	Comp. rend. <u>269B</u> , 1154-1156 (1969).	life
Druetta, M., & Poulizac, M.	Phys. Letters <u>29A</u> , 651-652 (1969).	life
Sinanoglu, O.	"Atomic Physics," 131-160 (Plenum Press, New York, 1969).	quant.
Weiss, A. W.	Phys. Rev. <u>188</u> , 119-130 (1969).	interp.
Westhaus, P. & Sinanoglu, O.	Phys. Rev. <u>183</u> , 56-68 (1969); Astrophys. J. <u>157</u> , 997-1005 (1969).	quant.
Druetta, M., Poulizac, M. C. & Desesquelles, J.	J. Opt. Soc. Am. <u>60</u> , 1463-1465 (1970).	life
Martinson, I.	Nucl. Instrum. Methods <u>90</u> , 81-84 (1970).	life
Nicolaidis, C. & Sinanoglu, O.	Nucl. Instrum. Methods <u>90</u> , 133-136 (1970).	quant.
Ceyzeriat, P., Denis, A., Desesquelles, J., Druetta, M., & Poulizac, M. C.	Nucl. Instrum. Methods <u>90</u> , 103-108 (1970).	life
Martinson, I., Berry, H. G., Bickel, W. S., & Oona, H.	J. Opt. Soc. Am. <u>61</u> , 519-523 (1971).	life

0 V

Druetta, M.	Comp. rend. <u>269B</u> , 1154-1156 (1969).	life
Ceyzeriat, P., Denis, A., Desesquelles, J., Druetta, M., & Poulizac, M. C.	Nucl. Instrum. Methods <u>90</u> , 103-108 (1970).	life
Martinson, I., Berry, H. G., Bickel, W. S., & Oona, H.	J. Opt. Soc. Am. <u>61</u> , 519-523 (1971).	life

0 VI

Ali, M. A. & Schaad, L. J.	J. Phys. B (Proc. Phys. Soc.) Ser. 2, <u>2</u> , 1304-1308 (1969).	quant.
Barrette, L., Knystautas, E. J., Neveu, B., & Drouin, R.	Nucl. Instrum. Methods <u>90</u> , 59-61 (1970).	life

Druetta, M., Ceyzeriat, P., & Poulizac, M. C.	Comp. rend. <u>271</u> , 846-848 (1970).	life
Dufay, M., Denis, A., & Desesquelles, J.	Nucl. Instrum. Methods <u>90</u> , 85-91 (1970).	life
Donnally, B., Smith, W. W., Pegg, D. J., Brown, M., & Sellin, I. A.	Phys. Rev. A <u>4</u> , 122-125 (1971).	life
Knystautas, E. J., Barrette, L., Neveu, B. & Drouin, R.	J. Quant. Spectrosc. Radiat. Transfer <u>11</u> , 75-79 (1971).	life
Martinson, I., Berry, H. G., Bickel, W. S., & Gona, H.	J. Opt. Soc. Am. <u>61</u> , 519-523 (1971).	life

Ø VII

Senashenko, V. S. & Teku, B.	Vestnik Moskovskogo Universitet Ser. 3 fiz. i astron., 120-122 (1968).	quant.
Brown, R. T.	Astrophys. J. <u>158</u> , 829-837 (1969).	quant.
Dalgarno, A., & Drake, G. W. F.	Mem. de la Societe Royale des Sciences de Liege 5th Series <u>17</u> , 69-77 (1969).	quant. forb.
Drake, G.W.F. & Dalgarno, A.	Phys. Rev. A <u>1</u> , 1325-1329 (1970).	quant.
Dufay, M., Denis, A., & Desesquelles, J.	Nucl. Instrum. Methods <u>90</u> , 85-91 (1970).	life
Sellin, I. A., Brown, M., Smith, W. W., & Donnally, B.	Phys. Rev. A <u>2</u> , 1189-1192 (1970).	life

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P (Phosphorus)*

P III

Andersen, T., Desesquelles, J., Jessen, K. A., & Sørensen, G.	Comp. rend. <u>271</u> , 685-688 (1970).	life
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P IV

Andersen, T., Desesquelles, J., Jessen, K. A., & Sørensen, G.	Comp. rend. <u>271</u> , 685-688 (1970).	life
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*See also Section 3.2 for some further references.

P V

Andersen, T., Desesquelles, J.,
 Jessen, K. A., & Sørensen, G. Comp. rend. 271, 685-688 (1970). life

P XI

Weiss, A. W. Phys. Rev. 188, 119-130 (1969). interp.

P XIV

Brown, R. T. Astrophys. J. 158, 829-837 (1969). quant.

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Pb (Lead)

Pb I

Addink, N. W. H. "Proc. of XIV Colloquium Spectroscopicum
 Internationale," B1, 201-208 (Debrecen,
 Hungary, 1967). comm.

Garpman, S., Lido, G., Rydberg, S. &
 Svanberg, S. Z. Physik 241, 217-235 (1971). life

Pb II

Trukhan, E. P. & Kiselevskii, L. I. Doklady Akad. Nauk Belorusskoi (B.S.S.R.) 11,
 122-125 (1967). emiss., rel.

Pb III

Trukhan, E. P. & Kiselevskii, L. I. Doklady Akad. Nauk Belorusskoi (B.S.S.R.) 11,
 122-125 (1967). emiss., rel.

Pb IV

Trukhan, E. P. & Kiselevskii, L. I. Doklady Akad. Nauk Belorusskoi (B.S.S.R.) 11, emiss., rel.
122-125 (1967).

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Rb (Rubidium)

Rb I

Hawkins, W. B. Phys. Rev. 182, 39-42 (1969). quant., rel.
Altman, E. L., & Kazantsev, S. A. Optics and Spectroscopy (U.S.S.R.) 28, 432-433 life
(1970).
Schmieder, R. W., Lurio, A., Happer, Phys. Rev. A 2, 1216-1228 (1970). life
W., & Khadjavi, A.

Rb IV

Gruzdev, P. F. Optics and Spectroscopy (U.S.S.R.) 27, 479-481 quant.
(1969).

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Rh (Rhodium)

Rh I

Addink, N. W. H. "Proc. of XIV Colloquium Spectroscopicum comm.
Internationale," B1, 201-208 (Debrecen,
Hungary, 1967).

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Ru (Ruthenium)

Ru I

Addink, N. W. H. "Proc. of XIV Colloquium Spectroscopicum
Internationale," B1, 201-208 (Debrecen,
Hungary, 1967). comm.

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S (Sulfur)*

S I

Kreml, H., & Schmid, G. Spectrochim. Acta 23B, 819-825 (1968). emiss., rel
Gruzdev, P. F. Optics and Spectroscopy (U.S.S.R.) 28, 334-337 quant.
(1969).

S II

Czyzak, S. J. & Krueger, T. K. Monthly Notices Roy. Astron. Soc. 129, 103 comm. forb.
(1965).
Bashkin, S., Bickel, W. S. & J. Opt. Soc. Am. 59, 879-881 (1969). life
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Berry, H. G., Schectman, R. M., J. Opt. Soc. Am. 60, 335-344 (1970). life
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U.S. DEPT. OF COMM. BIBLIOGRAPHIC DATA SHEET	1. PUBLICATION OR REPORT NO. NBS SP-320 Supplement 1	2. Gov't Accession No.	3. Recipient's Accession No.
4. TITLE AND SUBTITLE Bibliography on Atomic Transition Probabilities July 1969 through June 1971		5. Publication Date September 1971	
		6. Performing Organization Code	
7. AUTHOR(S) J. R. Fuhr and W. L. Wiese		8. Performing Organization	
9. PERFORMING ORGANIZATION NAME AND ADDRESS NATIONAL BUREAU OF STANDARDS DEPARTMENT OF COMMERCE WASHINGTON, D.C. 20234		10. Project/Task/Work Unit No. 2320471	
		11. Contract/Grant No.	
2. Sponsoring Organization Name and Address Same as No. 9.		13. Type of Report & Period Covered July 1969 - June 1971	
		14. Sponsoring Agency Code	
5. SUPPLEMENTARY NOTES			
<p>6. ABSTRACT (A 200-word or less factual summary of most significant information. If document includes a significant bibliography or literature survey, mention it here.)</p> <p>This is the first supplement to the NBS Special Publication 320, "Bibliography on Atomic Transition Probabilities," and it covers the most recent literature on the subject from July 1969 through June 1971. The papers are arranged according to elements and stages of ionization, and the method employed and classification of transitions are indicated for each reference. Only articles on discrete transitions, both allowed and forbidden, are listed. Papers containing data for many elements within isoelectronic sequences are collected separately in front of the list in order to keep this bibliography to a reasonable size. Also included is a selected list of new papers dealing with the subject of atomic transition probabilities from a general point of view.</p>			
<p>17. KEY WORDS (Alphabetical order, separated by semicolons)</p> <p>Allowed; atomic; discrete; forbidden; transition probability.</p>			
<p>18. AVAILABILITY STATEMENT</p> <p><input checked="" type="checkbox"/> UNLIMITED.</p> <p><input type="checkbox"/> FOR OFFICIAL DISTRIBUTION. DO NOT RELEASE TO NTIS.</p>		<p>19. SECURITY CLASS (THIS REPORT)</p> <p>UNCLASSIFIED</p>	<p>21. NO. OF PAGES</p> <p>67</p>
		<p>20. SECURITY CLASS (THIS PAGE)</p> <p>UNCLASSIFIED</p>	<p>22. Price</p> <p>.65</p>



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