NSRDS–NBS 3, Section 7

U.S. DEPARTMENT OF COMMERCE / National Bureau of Standards

NATIONAL STANDARD NSRDS REFERENCE DATA SYSTEM

Selected Tables of Atomic Spectra

Atomic Energy Levels and Multiplet Tables

O I

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The National Bureau of Standards[1] was established by an act of Congress March 3, 1901. The Bureau's overall goal is to strengthen and advance the Nation's science and technology and facilitate their effective application for public benefit. To this end, the Bureau conducts research and provides: (1) a basis for the Nation's physical measurement system, (2) scientific and technological services for industry and government, (3) a technical basis for equity in trade, and (4) technical services to promote public safety. The Bureau consists of the Institute for Basic Standards, the Institute for Materials Research, the Institute for Applied Technology, the Institute for Computer Sciences and Technology, and the Office for Information Programs.

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Office of Standard Reference Data — Office of Information Activities — Office of Technical Publications — Library — Office of International Relations — Office of International Standards.

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

[2] Located at Boulder, Colorado 80302.

Selected Tables of Atomic Spectra

A Atomic Energy Levels - Second Edition

B Multiplet Tables

O I

Data Derived from the Analyses of Optical Spectra

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Abstract

The present publication is the seventh Section of a series being prepared in response to the need for a current revision of two sets of the author's tables containing data on atomic spectra as derived from analyses of optical spectra. As in the previous Sections, Part A contains the atomic energy levels and Part B the multiplet tables. Section 7 presents this material for the first spectrum of oxygen, O I. The form of presentation is described in detail in the text to Section 1.

Key words: Atomic energy levels, O I; Atomic spectra, O I; Multiplet Table, O I; Oxygen, first spectrum; Spectrum O I; Wavelengths, O I.

Foreword

The National Standard Reference Data System provides access to the quantitative data of physical science, critically evaluated and compiled for convenience and readily accessible through a variety of distribution channels. The System was established in 1963 by action of the President's Office of Science and Technology and the Federal Council for Science and Technology, and responsibility to administer it was assigned to the National Bureau of Standards.

NSRDS receives advice and planning assistance from a Review Committee of the National Research Council of the National Academy of Sciences-National Academy of Engineering. A number of Advisory Panels, each concerned with a single technical area, meet regularly to examine major portions of the program, assign relative priorities, and identify specific key problems in need of further attention. For selected specific topics, the Advisory Panels sponsor subpanels which make detailed studies of users' needs, the present state of knowledge, and existing data resources as a basis for recommending one or more data compilation activities. This assembly of advisory services contributes greatly to the guidance of NSRDS activities.

The System now includes a complex of data centers and other activities in academic institutions and other laboratories. Components of the NSRDS produce compilations of critically evaluated data, reviews of the state of quantitative knowledge in specialized areas, and computations of useful functions derived from standard reference data. The centers and projects also establish criteria for evaluation and compilation of data and recommend improvements in experimental techniques. They are normally associated with research in the relevant field.

The technical scope of NSRDS is indicated by the categories of projects active or being planned: nuclear properties, atomic and molecular properties, solid state properties, thermodynamic and transport properties, chemical kinetics, and colloid and surface properties.

Reliable data on the properties of matter and materials are a major foundation of scientific and technical progress. Such important activities as basic scientific research, industrial quality control, development of new materials for building and other technologies, measuring and correcting environmental pollution depend on quality reference data. In NSRDS, the Bureau's responsibility to support American science, industry, and commerce is vitally fulfilled.

Ernest Ambler, *Acting Director*

Preface

The present publication is the seventh Section of a series that is being prepared in response to the increasing demand for a current revision of two sets of tables containing data on atomic spectra as derived from analyses of optical spectra.

The first set, Atomic Energy Levels, NBS Circular 467, consists of three Volumes published, respectively, in 1949, 1952 and 1958. This Circular has been reprinted as NSRDS–NBS 35, Volumes I, II and III.

The second set consists of two Multiplet Tables; one published in 1945 by the Princeton University Observatory, containing multiplets having wavelengths longer than 3000 Å; the other, An Ultraviolet Multiplet Table, NBS Circular 488, appearing in five Sections, the first in 1950, the second in 1952, and the others in 1962. The Princeton Multiplet Table was reprinted in 1972 as NSRDS–NBS 40.

The present series includes both sets of data, the energy levels and multiplet tables, as parts A and B, respectively, for selected spectra contained in Volume I of "Atomic Energy Levels." The Sections are being published at irregular intervals as revised analyses become available. A flexible paging system permits the arrangement of the various Sections by atomic number, regardless of the order in which the separate spectra are published. Section 1 includes three spectra of silicon, $Z=14$; Si II, Si III, Si IV. Section 2 contains similar data for Si I. Section 3 covers all spectra of carbon, $Z=6$: C I, C II, C III, C IV, C V, C VI. Section 4 includes the last four spectra of nitrogen, $Z=7$: N IV, N V, N VI, N VII. Section 5 completes the spectra of nitrogen, N I, N II, N III. Section 6 contains the spectra of hydrogen, $Z=1$: H I, D, T. The present Section, 7, contains the first spectrum of oxygen, $Z=8$: O I. The form of presentation of the data is described in detail in the text of Section 1. All Sections are arranged identically, and the same conversion factor, cm^{-1} to eV, 0.000123981 is used throughout.

The manuscript has been prepared by Charlotte E. Moore, who has published the earlier tables. She appreciates the cordial cooperation of numerous atomic spectroscopists. She is particularly indebted to colleagues in Sweden, B. Edlén and K.B.S. Eriksson for their helpful guidance and for providing valuable data on the analysis. The splendid work of Barbara N. Somerville in typing the press copy of this difficult material is, also, gratefully acknowledged.

Washington, D.C., June 1975.

Contents

NSRDS–NBS 3, SECTION 7

OXYGEN $Z = 8$

A O I Atomic Energy Levels

B O I Multiplet Table

OXYGEN

Part A

O I

8 electrons $Z=8$

Ground state $1s^2\ 2s^2\ 2p^4\ {}^3P_2$

$2p^4\ {}^3P_2$ 109837.02 ± 0.06 cm^{-1}, 910.440 Å (Vac) I P 13.618 eV

The classical paper on O I published in 1943 by B. Edlén has been revised and extended by K. B. S. Eriksson, H. B. S. Isberg and B. Isberg. Their publications in 1963, 1965, 1967, and 1968, have been used for the present compilation. The work of R. E. Huffman, J. C. Larrabee and Y. Tanaka is quoted for the extended absorption series observed from the ground state combinations in the ranges 122 Å to 149 Å and 666 Å to 952 Å. The paper on "Energy Spectra of Auto-Ionizing Electrons in Oxygen," by M. E. Rudd and K. Smith, also includes experimental and theoretical energy levels and transitions in these series, expressed in eV. Their observations are for the most part included by Huffman and his associates.

In 1965 Eriksson pointed out the need for a correction of -0.012 cm^{-1} to selected terms in the 1963 paper by him and Isberg. This correction has been made.

The limits are from the 1968 reference.

O I—Continued

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O I

Configuration	Desig.	J	Level	Interval
$2s^2\ 2p^4$	$2p^4\ {}^3P$	2	0.000	−158.265
		1	158.265	−68.712
		0	226.977	
$2s^2\ 2p^4$	$2p^4\ {}^1D$	2	15867.862	
$2s^2\ 2p^4$	$2p^4\ {}^1S$	0	33792.583	
$2s^2\ 2p^3(^4S°)3s$	$3s\ {}^5S°$	2	73768.200	
$2s^2\ 2p^3(^4S°)3s$	$3s\ {}^3S°$	1	76794.978	
$2s^2\ 2p^3(^4S°)3p$	$3p\ {}^5P$	1	86625.757	2.021
		2	86627.778	3.676
		3	86631.454	
$2s^2\ 2p^3(^4S°)3p$	$3p\ {}^3P$	2	88631.146	0.559
		1	88630.587	−0.716
		0	88631.303	
$2s^2\ 2p^3(^4S°)4s$	$4s\ {}^5S°$	2	95476.728	
$2s^2\ 2p^3(^4S°)4s$	$4s\ {}^3S°$	1	96225.049	
$2s^2\ 2p^3(^4S°)3d$	$3d\ {}^5D°$	4	97420.630	−0.086
		3	97420.716	−0.123
		2	97420.839	−0.103
		1	97420.942	−0.049
		0	97420.991	
$2s^2\ 2p^3(^4S°)3d$	$3d\ {}^3D°$	1	97488.378	0.070
		2	97488.448	0.090
		3	97488.538	
$2s^2\ 2p^3(^4S°)4p$	$4p\ {}^5P$	1	99092.968	0.673
		2	99093.641	1.196
		3	99094.837	
$2s^2\ 2p^3(^4S°)4p$	$4p\ {}^3P$	2	99681.049	0.081
		1	99680.968	−0.341
		0	99681.309	
$2s^2\ 2p^3(^2D°)3s$	$3s'\ {}^3D°$	3	101135.407	−12.119
		2	101147.526	−7.896
		1	101155.422	
$2s^2\ 2p^3(^4S°)5s$	$5s\ {}^5S°$	2	102116.698	
$2s^2\ 2p^3(^4S°)5s$	$5s\ {}^3S°$	1	102411.995	

O I

Configuration	Desig.	J	Level	Interval
$2s^2\ 2p^3(^2D°_{1\frac{1}{2}})3s$	$3s'\ {}^1D°$	2	102662.026	
$2s^2\ 2p^3(^4S°)4d$	$4d\ {}^5D°$	4	102865.506	−0.041
		3	102865.547	−0.059
		2	102865.606	−0.049
		1	102865.655	−0.024
		0	102865.679	
$2s^2\ 2p^3(^4S°)4d$	$4d\ {}^3D°$	3	102908.374	−0.069
		2	102908.443	−0.046
		1	102908.489	
$2s^2\ 2p^3(^4S°)4f$	$4f\ {}^5F$	5 to 1	102968.249	
$2s^2\ 2p^3(^4S°)4f$	$4f\ {}^3F$	4, 3, 2	102968.343	
$2s^2\ 2p^3(^4S°)5p$	$5p\ {}^5P$	1	103625.754	0.357
		2	103626.111	0.500
		3	103626.611	
$2s^2\ 2p^3(^4S°)5p$	$5p\ {}^3P$	2	103869.968	−0.060
		1	103870.028	−0.224
		0	103870.252	
$2s^2\ 2p^3(^4S°)6s$	$6s\ {}^5S°$	2	105019.307	
$2s^2\ 2p^3(^4S°)6s$	$6s\ {}^3S°$	1	105165.232	
$2s^2\ 2p^3(^4S°)5d$	$5d\ {}^5D°$	4	105385.354	−0.023
		3	105385.377	−0.032
		2	105385.409	−0.027
		1	105385.436	−0.013
		0	105385.449	
$2s^2\ 2p^3(^4S°)5d$	$5d\ {}^3D°$	1, 2, 3	105409.008	
$2s^2\ 2p^3(^4S°)5f$	$5f\ {}^5F$	1 to 5	105441.645	
$2s^2\ 2p^3(^4S°)5f$	$5f\ {}^3F$	4, 3, 2	105441.724	
$2s^2\ 2p^3(^4S°)6p$	$6p\ {}^5P$	1	105788.431	0.164
		2	105788.595	0.261
		3	105788.856	
$2s^2\ 2p^3(^4S°)6p$	$6p\ {}^3P$	2, 1, 0	105912.031	
$2s^2\ 2p^3(^4S°)7s$	$7s\ {}^5S°$	2	106545.354	
$2s^2\ 2p^3(^4S°)7s$	$7s\ {}^3S°$	1	106627.934	

O I—Continued

Configuration	Desig.		J	Level	Interval
$2s^2\ 2p^3(^4S°)6d$	$6d$	$^5D°$	4	106751.447	
			3	106751.458	−0.011
			2	106751.474	−0.016
			1	106751.487	−0.013
			0	106751.494	−0.007
$2s^2\ 2p^3(^4S°)6d$	$6d$	$^3D°$	3, 2, 1	106765.803	
$2s^2\ 2p^3(^4S°)6f$	$6f$	^5F	5 to 1	106785.160	
$2s^2\ 2p^3(^4S°)6f$	$6f$	^3F	4, 3, 2	106785.201	
$2s^2\ 2p^3(^4S°)6g$	$6g$	$^{5,3}G°$	6 to 2	106787.891	
$2s^2\ 2p^3(^4S°)8s$	$8s$	$^5S°$	2	107446.036	
$2s^2\ 2p^3(^4S°)8s$	$8s$	$^3S°$	1	107497.224	
$2s^2\ 2p^3(^4S°)7d$	$7d$	$^5D°$	4	107573.476	
			3	107573.484	−0.008
			2	107573.495	−0.011
			1	107573.504	−0.009
			0	107573.508	−0.004
$2s^2\ 2p^3(^4S°)7d$	$7d$	$^3D°$	3, 2, 1	107582.777	
$2s^2\ 2p^3(^4S°)7f$	$7f$	^5F	5 to 1	107595.140	
$2s^2\ 2p^3(^4S°)7f$	$7f$	^3F	4, 3, 2	107595.147	
$2s^2\ 2p^3(^4S°)9s$	$9s$	$^3S°$	1	108056.0	
$2s^2\ 2p^3(^4S°)8d$	$8d$	$^5D°$	4	108106.072	
			3	108106.077	−0.005
			2	108106.085	−0.008
			1	108106.091	−0.006
			0	108106.094	−0.003
$2s^2\ 2p^3(^4S°)8d$	$8d$	$^3D°$	3, 2, 1	108114.0	
$2s^2\ 2p^3(^4S°)10s$	$10s$	$^3S°$	1	108436.3	
$2s^2\ 2p^3(^4S°)9d$	$9d$	$^3D°$	3, 2, 1	108476.7	
$2s^2\ 2p^3(^4S°)11s$	$11s$	$^3S°$	1	108705.5	
$2s^2\ 2p^3(^4S°)10d$	$10d$	$^3D°$	3, 2, 1	108736.1	
$2s^2\ 2p^3(^4S°)12s$	$12s$	$^3S°$	1	108906.1	
$2s^2\ 2p^3(^4S°)11d$	$11d$	$^3D°$	3, 2, 1	108927.2	
$2s^2\ 2p^3(^4S°)13s$	$13s$	$^3S°$	1	109056.0	
$2s^2\ 2p^3(^4S°)12d$	$12d$	$^3D°$	3, 2, 1	109073.3	
$2s^2\ 2p^3(^4S°)14s$	$14s$	$^3S°$	1	109171.7	
$2s^2\ 2p^3(^4S°)13d$	$13d$	$^3D°$	3, 2, 1	109186.3	
$2s^2\ 2p^3(^4S°)15s$	$15s$	$^3S°$	1	109265.9	
$2s^2\ 2p^3(^4S°)14d$	$14d$	$^3D°$	3, 2, 1	109278.2	
$2s^2\ 2p^3(^4S°)16s$	$16s$	$^3S°$	1	109341.0	

O I—Continued

Configuration	Desig.		J	Level	Interval
$2s^2\ 2p^3(^4S°)15d$	$15d$	$^3D°$	3, 2, 1	109348.9	
$2s^2\ 2p^3(^4S°)17s$	$17s$	$^3S°$	1	109402.4	
$2s^2\ 2p^3(^4S°)16d$	$16d$	$^3D°$	3, 2, 1	109409.5	
$2s^2\ 2p^3(^4S°)18s$	$18s$	$^3S°$	1	109454.7	
$2s^2\ 2p^3(^4S°)17d$	$17d$	$^3D°$	3, 2, 1	109457.6	
$2s^2\ 2p^3(^4S°)18d$	$18d$	$^3D°$	3, 2, 1	109498.0	
$2s^2\ 2p^3(^4S°)19s$	$19s$	$^3S°$	1	109499.0	
$2s^2\ 2p^3(^4S°)19d$	$19d$	$^3D°$	3, 2, 1	109533.2	
$2s^2\ 2p^3(^4S°)20s$	$20s$	$^3S°$	1	109533.3	
$2s^2\ 2p^3(^4S°)20d$	$20d$	$^3D°$	3, 2, 1	109561.5	
$2s^2\ 2p^3(^4S°)21s$	$21s$	$^3S°$	1	109562.3	
$2s^2\ 2p^3(^4S°)22s$	$22s$	$^3S°$	1	109589.0	
$2s^2\ 2p^3(^4S°)21d$	$21d$	$^3D°$	3, 2, 1	109589.3	
$2s^2\ 2p^3(^4S°)23s$	$23s$	$^3S°$	1	109610.5	
$2s^2\ 2p^3(^4S°)22d$	$22d$	$^3D°$	3, 2, 1	109610.5	
$2s^2\ 2p^3(^4S°)24s$	$24s$	$^3S°$	1	109630.0	
$2s^2\ 2p^3(^4S°)23d$	$23d$	$^3D°$	3, 2, 1	109630.0	
$2s^2\ 2p^3(^4S°)25s$	$25s$	$^3S°$	1	109647.7	
$2s^2\ 2p^3(^4S°)24d$	$24d$	$^3D°$	3, 2, 1	109647.7	
$2s^2\ 2p^3(^4S°)26s$	$26s$	$^3S°$	1	109661.4	
$2s^2\ 2p^3(^4S°)25d$	$25d$	$^3D°$	3, 2, 1	109661.4	
$2s^2\ 2p^3(^4S°)27s$	$27s$	$^3S°$	1	109673.5	
$2s^2\ 2p^3(^4S°)26d$	$26d$	$^3D°$	3, 2, 1	109673.5	
$2s^2\ 2p^3(^4S°)28s$	$28s$	$^3S°$	1	109686.2	
$2s^2\ 2p^3(^4S°)27d$	$27d$	$^3D°$	3, 2, 1	109686.2	
$2s^2\ 2p^3(^4S°)29s$	$29s$	$^3S°$	1	109695.9	
$2s^2\ 2p^3(^4S°)28d$	$28d$	$^3D°$	3, 2, 1	109695.9	
$2s^2\ 2p^3(^4S°)30s$	$30s$	$^3S°$	1	109705.4	
$2s^2\ 2p^3(^4S°)29d$	$29d$	$^3D°$	3, 2, 1	109705.4	
$2s^2\ 2p^3(^4S°)31s$	$31s$	$^3S°$	1	109713.7	
$2s^2\ 2p^3(^4S°)30d$	$30d$	$^3D°$	3, 2, 1	109713.7	
O II $2s^2\ 2p^3(^4S°_{1\frac{1}{2}})$	*Limit*			109837.02 ± .06	
$2s^2\ 2p^3(^2D°)3p$	$3p'$	^1P	1	113204.445	

O I—Continued

Configuration	Desig.	J	Level	Interval
$2s^2\ 2p^3(^2D^\circ)3p$	$3p'\ ^3D$	3	113294.816	
		2	113294.854	−0.038
		1	113298.320	−3.466
$2s^2\ 2p^3(^2D^\circ)3p$	$3p'\ ^3F$	4	113714.444	
		3	113721.413	−6.969
		2	113727.165	−5.752
$2s^2\ 2p^3(^2P^\circ)3s$	$3s''\ ^3P^\circ$	2	113910.957	
		1	113921.391	−10.434
		0	113927.534	−6.143
$2s^2\ 2p^3(^2D^\circ)3p$	$3p'\ ^1F$	3	113996.239	
$2s^2\ 2p^3(^2P^\circ)3s$	$3s''\ ^1P^\circ$	1	115918.143	
$2s^2\ 2p^3(^2D^\circ)3p$	$3p'\ ^1D$	2	116631.094	
$2s^2\ 2p^3(^2D^\circ)4s$	$4s'\ ^3D^\circ$	3	122419.7	
		2	122433.2	−13.5
		1	122441.0	−7.8
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})4s$	$4s'\ ^1D^\circ$	2	122797.661	
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})3d$	$3d'\ ^3P^\circ$	2	123296.777	
		1	123355.512	−58.735
		0	123387.339	−31.827
$2s^2\ 2p^3(D^\circ_{2\frac{1}{2}})3d$	$3d'\ ^3F^\circ$	4	124213.607	
		3	124219.025	−5.418
		2	124224.118	−5.093
$2s^2\ 2p^3(^2D^\circ)3d$	$3d'\ ^3G^\circ$	5	124240.118	
		4	124238.650	1.468
		3	124252.926	−14.276
$2s^2\ 2p^3(^2D^\circ_{2\frac{1}{2}})3d$	$3d'\ ^1S^\circ$	0	124242.576	
$2s^2\ 2p^3(^2D^\circ_{2\frac{1}{2}})3d$	$3d'\ ^3D^\circ$	3	124247.1	
		2	124257.7	−10.6
		1	124264.0	−6.3
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})3d$	$3d'\ ^1G^\circ$	4	124258.780	
$2s^2\ 2p^3(^2D^\circ_{2\frac{1}{2}})3d$	$3d'\ ^1P^\circ$	1	124274	
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})3d$	$3d'\ ^1D^\circ$	2	124319.175	
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})3d$	$3d'\ ^1F^\circ$	3	124326.779	
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})3d$	$3d'\ ^3S^\circ$	1	124336.3	
$2s^2\ 2p^3(^2D^\circ)4p$	$4p'\ ^3D$	3	125775.493	
		2	125782.889	−7.396
		1	125788.008	−5.119
$2s\ 2p^5$	$2p^5\ ^3P^\circ$	2	126266.896	
		1	126340.225	−73.329
		0	126383.751	−43.526
$2s^2\ 2p^3(^2P^\circ)3p$	$3p''\ ^3D$	3	127282.626	
		2	127288.349	−5.723
		1	127291.638	−3.289

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Configuration	Desig.	J	Level	Interval
$2s^2\ 2p^3(^2P^\circ)3p$	$3p''\ ^1P$	1	127667.754	
$2s^2\ 2p^3(^2P^\circ)3p$	$3p''\ ^1D$	2	128594.916	
$2s^2\ 2p^3(^2D^\circ)5s$	$5s'\ ^3D^\circ$	3	128978.8	
		2	128990.2	−11.4
		1	128998.2	−8.0
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})5s$	$5s'\ ^1D^\circ$	2	129132.323	
$2s^2\ 2p^3(^2D^\circ_{2\frac{1}{2}})4d$	$4d'\ ^3F^\circ$	4	129666.907	
		3		
		2		
$2s^2\ 2p^3(^2D^\circ)4d$	$4d'\ ^3G^\circ$	5	129680.522	
		4	129679.841	0.681
		3	129693.488	−13.647
$2s^2\ 2p^3(^2D^\circ_{2\frac{1}{2}})4d$	$4d'\ ^1S^\circ$	0	129682.528	
$2s^2\ 2p^3(^2D^\circ_{2\frac{1}{2}})4d$	$4d'\ ^1P^\circ$	1	129683	
$2s^2\ 2p^3(^2D^\circ_{2\frac{1}{2}})4d$	$4d'\ ^3D^\circ$	3	129692.3	
		2	129697.5	−5.2
		1	129703.0	−5.5
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})4d$	$4d'\ ^1G^\circ$	4	129699.521	
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})4d$	$4d'\ ^1D^\circ$	2	129731	
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})4d$	$4d'\ ^3S^\circ$	1	129736.6	
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})4d$	$4d'\ ^1F^\circ$	3	129737.052	
$2s^2\ 2p^3(^2D^\circ)4f$	$4f'\ ^3G$	5	129777.940	
		4		
		3		
$2s^2\ 2p^3(^2D^\circ)4f$	$4f'\ ^3H$	4		
		5	129779.919	
		6	129779.929	0.010
$2s^2\ 2p^3(^2D^\circ)4f$	$4f'\ ^1H$	5	129799.831	
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})4d$	$4d'\ ^3P^\circ$	2	129970.000	
		1	129979.384	−9.384
		0	129984.553	− .169
$2s^2\ 2p^3(^2P^\circ)3p$	$3p''\ ^1S$	0	130942.923	
$2s^2\ 2p^3(^2D^\circ)6s$	$6s'\ ^3D^\circ$	3	131854.5	
		2	131865.5	−11.0
		1	131876.1	−10.6
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})6s$	$6s'\ ^1D^\circ$	2	131936	
$2s^2\ 2p^3(^2D^\circ_{2\frac{1}{2}})5d$	$5d'\ ^3F^\circ$	4	132190.671	
		3		
		2		
$2s^2\ 2p^3(^2D^\circ)5d$	$5d'\ ^3G^\circ$	3		
		4	132198.046	
		5	132198.396	0.350

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Configuration	Desig.	J	Level	Interval
$2s^2\ 2p^3(^2D^\circ_{2\frac{1}{2}})5d$	$5d'\ ^1P^\circ$	1	132203	
$2s^2\ 2p^3(^2D^\circ_{2\frac{1}{2}})5d$	$5d'\ ^3D^\circ$	3	132203.4	−10.4
		2	132213.8	−4.3
		1	132218.1	
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})5d$	$5d'\ ^1G^\circ$	4	132217.679	
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})5d$	$5d'\ ^3S^\circ$	1	132232.6	
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})5d$	$5d'\ ^1D^\circ$	2	132235	
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})5d$	$5d'\ ^1F^\circ$	3	132240	
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})5d$	$5d'\ ^3P^\circ$	2	132311.1	−5.1
		1	132316.2	
		0		
$2s^2\ 2p^3(^2D^\circ)7s$	$7s'\ ^3D^\circ$	3	133369.8	−9.0
		2	133378.8	−11.4
		1	133390.2	
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})7s$	$7s'\ ^1D^\circ$	2	133421	
$2s^2\ 2p^3(^2D^\circ_{2\frac{1}{2}})6d$	$6d'\ ^3D^\circ$	3, 2, 1	133566.8	
$2s^2\ 2p^3(^2D^\circ_{2\frac{1}{2}})6d$	$6d'\ ^1P^\circ$	1	133569	
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})6d$	$6d'\ ^3S^\circ$	1	133577.9	
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})6d$	$6d'\ ^1D^\circ$	2	133587	
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})6d$	$6d'\ ^1F^\circ$	3	133591	
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})6d$	$6d'\ ^3P^\circ$	2	133622.0	−4.5
		1	133626.5	
		0		
$2s^2\ 2p^3(^2D^\circ)8s$	$8s'\ ^3D^\circ$	3	134265.3	−8.1
		2	134273.4	−11.7
		1	134285.1	
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})8s$	$8s'\ ^1D^\circ$	2	134305	
$2s^2\ 2p^3(^2D^\circ_{2\frac{1}{2}})7d$	$7d'\ ^3D^\circ$	3, 2, 1	134385.0	
$2s^2\ 2p^3(D^\circ_{2\frac{1}{2}})7d$	$7d'\ ^1P^\circ$	1	134387	
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})7d$	$7d'\ ^3S^\circ$	1	134402.5	
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})7d$	$7d'\ ^1D^\circ$	2	134409	
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})7d$	$7d'\ ^1F^\circ$	3	134409	
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})7d$	$7d'\ ^3P^\circ$	2	134421.4	−5.1
		1	134426.5	
		0		
$2s^2\ 2p^3(^2D^\circ)9s$	$9s'\ ^3D^\circ$	3	134839.0	−4.7
		2	134843.7	
		1		
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})9s$	$9s'\ ^1D^\circ$	2	134869	

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Configuration	Desig.	J	Level	Interval
$2s^2\ 2p^3(^2D^\circ_{2\frac{1}{2}})8d$	$8d'\ ^3D^\circ$	3, 2, 1	134919.2	
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})8d$	$8d'\ ^3S^\circ$	1	134919.2	
$2s^2\ 2p^3(^2D^\circ_{2\frac{1}{2}})8d$	$8d'\ ^1P^\circ$	1	134921	
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})8d$	$8d'\ ^1D^\circ$	2	134940	
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})8d$	$8d'\ ^1F^\circ$	3	134940	
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})8d$	$8d'\ ^3P^\circ$	2	134943.8	−3.3
		1	134947.1	
		0		
$2s^2\ 2p^3(^2D^\circ)10s$	$10s'\ ^3D^\circ$	3	135226.7	
		2		
		1		
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})10s$	$10s'\ ^1D^\circ$	2	135252	
$2s^2\ 2p^3(^2D^\circ_{2\frac{1}{2}})9d$	$9d'\ ^3D^\circ$	3, 2, 1	135283.7	
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})9d$	$9d'\ ^3S^\circ$	1	135283.7	
$2s^2\ 2p^3(^2D^\circ_{2\frac{1}{2}})9d$	$9d'\ ^1P^\circ$	1	135285	
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})9d$	$9d'\ ^3P^\circ$	2	135303.5	−1.5
		1	135305.0	
		0		
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})9d$	$9d'\ ^1D^\circ$	2	135304	
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})9d$	$9d'\ ^1F^\circ$	3	135304	
$2s^2\ 2p^3(^2D^\circ)11s$	$11s'\ ^3D^\circ$	3	135502.3	
		2		
		1		
$2s^2\ 2p^3(^2D^\circ_{2\frac{1}{2}})10d$	$10d'\ ^3D^\circ$	3, 2, 1	135541.7	
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})10d$	$10d'\ ^3S^\circ$	1	135541.7	
$2s^2\ 2p^3(^2D^\circ_{2\frac{1}{2}})10d$	$10d'\ ^1P^\circ$	1	135542	
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})10d$	$10d'\ ^3P^\circ$	2	135560.3	−1.9
		1	135562.2	
		0		
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})10d$	$10d'\ ^1D^\circ$	2	135565	
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})10d$	$10d'\ ^1F^\circ$	3	135565	
$2s^2\ 2p^3(^2P^\circ)4s$	$4s''\ ^3P^\circ$	2, 1, 0	[135681.7]	
$2s^2\ 2p^3(^2D^\circ)12s$	$12s'\ ^3D^\circ$	3	135701.8	
		2		
		1		
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})12s$	$12s'\ ^1D^\circ$	2	135723	
$2s^2\ 2p^3(^2D^\circ_{2\frac{1}{2}})11d$	$11d'\ ^3D^\circ$	3, 2, 1	135732.4	
$2s^2\ 2p^3(^2D^\circ_{1\frac{1}{2}})11d$	$11d'\ ^3S^\circ$	1	135732.4	

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Configuration	Desig.	J	Level	Interval
$2s^2\ 2p^3(^2D°_{2\frac{1}{2}})11d$	$11d'\ ^1P°$	1	135736	
$2s^2\ 2p^3(^2D°_{1\frac{1}{2}})11d$	$11d'\ ^3P°$	2	135752.9	
		1	135751.7	1.2
		0		
$2s^2\ 2p^3(^2D°_{1\frac{1}{2}})11d$	$11d'\ ^1D°$	2	135755	
$2s^2\ 2p^3(^2D°_{1\frac{1}{2}})11d$	$11d'\ ^1F°$	3	135755	
$2s^2\ 2p^3(^2D°)13s$	$13s'\ ^3D°$	3	135852.6	
		2		
		1		
$2s^2\ 2p^3(^2D°_{2\frac{1}{2}})12d$	$12d'\ ^3D°$	3, 2, 1	135876.4	
$2s^2\ 2p^3(^2D°_{1\frac{1}{2}})12d$	$12d'\ ^3S°$	1	135876.4	
$2s^2\ 2p^3(^2D°_{2\frac{1}{2}})12d$	$12d'\ ^1P°$	1	135887	
$2s^2\ 2p^3(^2D°_{1\frac{1}{2}})12d$	$12d'\ ^3P°$	2	135899.1	
		1	135896.9	2.2
		0		
$2s^2\ 2p^3(^2D°_{1\frac{1}{2}})12d$	$12d'\ ^1D°$	2	135902	
$2s^2\ 2p^3(^2D°_{1\frac{1}{2}})12d$	$12d'\ ^1F°$	3	135902	
$2s^2\ 2p^3(^2D°_{2\frac{1}{2}})13d$	$13d'\ ^3D°$	3, 2, 1	135986.4	
$2s^2\ 2p^3(^2D°_{1\frac{1}{2}})13d$	$13d'\ ^3S°$	1	135986.4	
$2s^2\ 2p^3(^2D°_{1\frac{1}{2}})14s$	$14s'\ ^1D°$	2	136000	
$2s^2\ 2p^3(^2D°_{2\frac{1}{2}})13d$	$13d'\ ^1P°$	1	136000	
$2s^2\ 2p^3(^2D°_{1\frac{1}{2}})13d$	$13d'\ ^3P°$	2	136011.0	
		1	136011.7	−0.7
		0		
$2s^2\ 2p^3(^2D°_{2\frac{1}{2}})14d$	$14d'\ ^3D°$	3, 2, 1	136071.3	
$2s^2\ 2p^3(^2D°_{1\frac{1}{2}})14d$	$14d'\ ^3S°$	1	136071.3	
$2s^2\ 2p^3(^2D°_{2\frac{1}{2}})14d$	$14d'\ ^1P°$	1	136085	
$2s^2\ 2p^3(^2D°_{1\frac{1}{2}})14d$	$14d'\ ^3P°$	2	136100.1	
		1		
		0		
$2s^2\ 2p^3(^2D°_{2\frac{1}{2}})15d$	$15d'\ ^3D°$	3, 2, 1	136138.9	
$2s^2\ 2p^3(^2D°_{1\frac{1}{2}})15d$	$15d'\ ^3S°$	1	136138.9	
$2s^2\ 2p^3(^2D°_{1\frac{1}{2}})15d$	$15d'\ ^3P°$	2	136171.5	
		1		
		0		
$2s^2\ 2p^3(^2D°_{2\frac{1}{2}})16d$	$16d'\ ^3D°$	3, 2, 1	136194.4	
$2s^2\ 2p^3(^2D°_{1\frac{1}{2}})16d$	$16d'\ ^3S°$	1	136194.4	

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Configuration	Desig.	J	Level	Interval
$2s^2\ 2p^3(^2D°_{1\frac{1}{2}})16d$	$16d'\ ^3P°$	2	136242.2	
		1		
		0		
$2s^2\ 2p^3(^2P°)4s$	$4s''\ ^1P°$	1	136353	
O II $2s^2\ 2p^3(^2D°)$	***Limit***	2½	136647.67	−19.79
"	***Limit***	1½	136667.46	
$2s^2\ 2p^3(^2P°)3d$	$3d''\ ^1D°$	2	137928	
$2s^2\ 2p^3(^2P°)3d$	$3d''\ ^3P°$	2, 1, 0	137946.5	
$2s^2\ 2p^3(^2P°)3d$	$3d''\ ^3D°$	3, 2, 1	137962.5	
$2s^2\ 2p^3(^2P°)3d$	$3d''\ ^1P°$	1	137981	
$2s^2\ 2p^3(^2P°)5s$	$5s''\ ^3P°$	2, 1, 0	142650.5	
$2s^2\ 2p^3(^2P°)5s$	$5s''\ ^1P°$	1	142743	
$2s^2\ 2p^3(^2P°)4d$	$4d''\ ^1D°$	2	143359	
$2s^2\ 2p^3(^2P°)4d$	$4d''\ ^3P°$	2, 1, 0	143363.4	
$2s^2\ 2p^3(^2P°)4d$	$4d''\ ^3D°$	3, 2, 1	143363.4	
$2s^2\ 2p^3(^2P°)4d$	$4d''\ ^1P°$	1	143384	
$2s^2\ 2p^3(^2P°)6s$	$6s''\ ^3P°$	2, 1, 0	145516.5	
$2s^2\ 2p^3(^2P°)6s$	$6s''\ ^1P°$	1	145620	
$2s^2\ 2p^3(^2P°)5d$	$5d''\ ^1D°$	2	145868	
$2s^2\ 2p^3(^2P°)5d$	$5d''\ ^3P°$	2, 1, 0	145870.5	
$2s^2\ 2p^3(^2P°)5d$	$5d''\ ^3D°$	3, 2, 1	145870.5	
$2s^2\ 2p^3(^2P°)5d$	$5d''\ ^1P°$	1	145887	
$2s^2\ 2p^3(^2P°)7s$	$7s''\ ^3P°$	2, 1, 0	147028.7	
$2s^2\ 2p^3(^2P°)7s$	$7s''\ ^1P°$	1	147057	
$2s^2\ 2p^3(^2P°)6d$	$6d''\ ^1D°$	2	147229	
$2s^2\ 2p^3(^2P°)6d$	$6d''\ ^3P°$	2, 1, 0	147230.1	
$2s^2\ 2p^3(^2P°)6d$	$6d''\ ^3D°$	3, 2, 1	147230.1	
$2s^2\ 2p^3(^2P°)6d$	$6d''\ ^1P°$	1	147240	
$2s^2\ 2p^3(^2P°)8s$	$8s''\ ^3P°$	2, 1, 0	147921.1	
$2s^2\ 2p^3(^2P°)8s$	$8s''\ ^1P°$	1	147942	
$2s^2\ 2p^3(^2P°)7d$	$7d''\ ^1D°$	2	148045	
$2s^2\ 2p^3(^2P°)7d$	$7d''\ ^3P°$	2, 1, 0	148047.7	
$2s^2\ 2p^3(^2P°)7d$	$7d''\ ^3D°$	3, 2, 1	148047.7	

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Configuration	Desig.	J	Level	Interval
$2s^2\ 2p^3(^2P°)7d$	$7d''\ ^1P°$	1	148058	
$2s^2\ 2p^3(^2P°)9s$	$9s''\ ^3P°$	2, 1, 0	148495.5	
$2s^2\ 2p^3(^2P°)9s$	$9s''\ ^1P°$	1	148505	
$2s^2\ 2p^3(^2P°)8d$	$8d''\ ^3P°$	2, 1, 0	148576.9	
$2s^2\ 2p^3(^2P°)8d$	$8d''\ ^3D°$	3, 2, 1	148576.9	
$2s^2\ 2p^3(^2P°)8d$	$8d''\ ^1D°$	2	148578	
$2s^2\ 2p^3(^2P°)8d$	$8d''\ ^1P°$	1	148582	
$2s^2\ 2p^3(^2P°)10s$	$10s''\ ^3P°$	2, 1, 0	148882.9	
$2s^2\ 2p^3(^2P°)10s$	$10s''\ ^1P°$	1	148891	
$2s^2\ 2p^3(^2P°)9d$	$9d''\ ^1D°$	2	148941	
$2s^2\ 2p^3(^2P°)9d$	$9d''\ ^3P°$	2, 1, 0	148945.4	
$2s^2\ 2p^3(^2P°)9d$	$9d''\ ^3D°$	3, 2, 1	148945.4	
$2s^2\ 2p^3(^2P°)9d$	$9d''\ ^1P°$	1	148946	
$2s^2\ 2p^3(^2P°)11s$	$11s''\ ^3P°$	2, 1, 0	149159.1	
$2s^2\ 2p^3(^2P°)11s$	$11s''\ ^1P°$	1	149168	
$2s^2\ 2p^3(^2P°)10d$	$10d''\ ^3P°$	2, 1, 0	149200.6	
$2s^2\ 2p^3(^2P°)10d$	$10d''\ ^3D°$	3, 2, 1	149200.6	
$2s^2\ 2p^3(^2P°)10d$	$10d''\ ^1D°$	2	149203	
$2s^2\ 2p^3(^2P°)12s$	$12s''\ ^3P°$	2, 1, 0	149359.4	
$2s^2\ 2p^3(^2P°)11d$	$11d''\ ^3P°$	2, 1, 0	149390.6	

O I—Continued

Configuration	Desig.	J	Level	Interval
$2s^2\ 2p^3(^3P°)11d$	$11d''\ ^3D°$	3, 2, 1	149390.6	
$2s^2\ 2p^3(^2P°)11d$	$11d''\ ^1D°$	2	149392	
$2s^2\ 2p^3(^2P°)13s$	$13s''\ ^3P°$	2, 1, 0	149514.4	
$2s^2\ 2p^3(^2P°)12d$	$12d''\ ^3P°$	2, 1, 0	149539.4	
$2s^2\ 2p^3(^2P°)12d$	$12d''\ ^3D°$	3, 2, 1	149539.4	
$2s^2\ 2p^3(^2P°)14s$	$14s''\ ^3P°$	2, 1, 0	149631.8	
$2s^2\ 2p^3(^2P°)13d$	$13d''\ ^3P°$	2, 1, 0	149652.2	
$2s^2\ 2p^3(^2P°)13d$	$13d''\ ^3D°$	3, 2, 1	149652.2	
$2s^2\ 2p^3(^2P°)14d$	$14d''\ ^3P°$	2, 1, 0	149744.9	
$2s^2\ 2p^3(^2P°)14d$	$14d''\ ^3D°$	3, 2, 1	149744.9	
$2s^2\ 2p^3(^2P°)15d$	$15d''\ ^3P°$	2, 1, 0	149815.6	
$2s^2\ 2p^3(^2P°)15d$	$15d''\ ^3D°$	3, 2, 1	149815.6	
$2s^2\ 2p^3(^2P°)17d$	$17d''\ ^3P°$	2, 1, 0	149923.7	
$2s^2\ 2p^3(^2P°)17d$	$17d''\ ^3D°$	3, 2, 1	149923.7	
$2s^2\ 2p^3(^2P°)18d$	$18d''\ ^3P°$	2, 1, 0	149961.5	
$2s^2\ 2p^3(^2P°)18d$	$18d''\ ^3D°$	3, 2, 1	149961.5	
$2s^2\ 2p^3(^2P°)19d$	$19d''\ ^3P°$	2, 1, 0	150000.8	
$2s^2\ 2p^3(^2P°)19d$	$19d''\ ^3D°$	3, 2, 1	150000.8	
O II $2s^2(2p^3\ ^2P°)$	***Limit***	.....	150305.6	

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O I Observed Terms

Config. $1s^2+$	Observed Terms									
$2s^2\ 2p^4$	$2p^4\ {}^3P$									
	$2p^4\ {}^1S$		$2p^4\ {}^1D$							
$2s\ 2p^5$	$2p^5\ {}^3P^\circ$									
	$ns(n \geq 3)$				$np(n \geq 3)$					
$2s^2\ 2p^3(^4S^\circ)nl$	$3–8s\ {}^5S^\circ$				$3–6p\ {}^5P$					
	$3–31s\ {}^3S^\circ$				$3–6p\ {}^3P$					
$2s^2\ 2p^3(^2D^\circ)nl'$			$3–13s'\ {}^3D^\circ$				$3,4p'\ {}^3D$	$3p'\ {}^3F$		
			$3–10,12,14s'\ {}^1D^\circ$			$3p'\ {}^1P$	$3p'\ {}^1D$	$3p'\ {}^1F$		
$2s^2\ 2p^3(^2P^\circ)nl''$		$3,5–14s''\ {}^3P^\circ$					$3p''\ {}^3D$			
		$3–11s''\ {}^1P^\circ$			$3p''\ {}^1S$	$3p''\ {}^1P$	$3p''\ {}^1D$			
	$nd(n \geq 3)$						$nf(n \geq 4)$			$ng(n \geq 5)$
$2s^2\ 2p^3(^4S^\circ)nl$			$3–8d\ {}^5D^\circ$				$4–7f\ {}^5F$			$6g\ {}^5G^\circ$
			$3–30d\ {}^3D^\circ$				$4–7f\ {}^3F$			$6g\ {}^3G^\circ$
$2s^2\ 2p^3(^2D^\circ)nl'$	$3–16d'\ {}^3S^\circ$	$3–16d'\ {}^3P^\circ$	$3–16d'\ {}^3D^\circ$	$3–5d'\ {}^3F^\circ$	$3–5d'\ {}^3G^\circ$		$4f'\ {}^3G$	$4f'\ {}^3H$		
	$3–4d'\ {}^1S^\circ$	$3–14d'\ {}^1P^\circ$	$3–12d'\ {}^1D^\circ$	$3–12d'\ {}^1F^\circ$	$3–5d'\ {}^1G^\circ$			$4f'\ {}^1H$		
$2s^2\ 2p^3(^2P^\circ)nl''$		$3–15,17–19d''\ {}^3P^\circ$	$3–15,17–19d''\ {}^3D^\circ$							
		$3–9d''\ {}^1P^\circ$	$3–11d''\ {}^1D^\circ$							

Part B

OXYGEN

O I (Z=8)

I P 13.618 eV Limit 109837.02 ± 0.06 cm^{-1} 910.440 Å (Vac)

Anal A List A April 1975

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A K. B. S. Eriksson and H. B. S. Isberg, Ark. Fys. (Stockholm) **37,** No. 17, 221–230 (1968). I P, T, C L, I; W L 2876 Å–18046 Å; Calc. W L 769 Å–1358 Å

B K. B. S. Eriksson and H. B. S. Isberg, Ark. Fys. (Stockholm) **24,** No. 41, 549–558 (1963). I P, T, C L, I; W L 4654 Å–18244 Å

C B. Isberg, Ark. Fys. (Stockholm) **35,** No. 40, 495–498 (1967). T, C L, I; W L 3348 Å–26173 Å

D K. B. S. Eriksson, Ark. Fys. (Stockholm) **30,** No. 16, 199–202 (1965). T, C L; W L, Forbidden transitions

E R. E. Huffman, J. C. Larrabee and Y. Tanaka, J. Chem. Phys. **46,** No. 6, 2213–2233 (1967). T, C L, G D, (I); W L, Absorption Series 666 Å–952 Å

F R. E. Huffman, J. C. Larrabee and Y. Tanaka, J. Chem. Phys. **47,** No. 11, 4462–4471 (1967). T, C L, (I); W L Absorption Series 748 Å–959 Å

B. Edlén, Kungl. Svenska, Vetenskapsakad. Handlingar [3] **20,** No. 10, 31 pp. (1943). I P, T, C L; W L 748 Å–1358 Å, 2876 Å–13163 Å

P Predicted Lines. Four-place wavelengths are quoted from references A and B and are entered with these authors as source.

New Multiplet Numbers, not inserted between older ones, start with UV 6 and 66. The Multiplet Numbers UV 6 through UV 10 in Nat. Bur. Stand. Circ. 488, Section 1, 17 (1950) have been abandoned.

m Masked

‡ Raie Ultime

* Blend

* and § Blend with Ar I

O I

I A	Ref.	Int.	E P Low	E P High	J	Multiplet No.
Air						
6300.304	D		0.00	1.96	2–2	$2p^4\ ^3P - 2p^4\ ^1D$ 1F
6363.776	D		0.02	1.96	1–2	
6391.733	P		0.03	1.96	0–2	
2958.365	P		0.00	4.19	2–0	$2p^4\ ^3P - 2p^4\ ^1S$ 2F
2972.288	D		0.02	4.19	1–0	
Vac						
1355.5977	A		0.00	9.15	2–2	$2p^4\ ^3P - 3s\ ^5S°$ UV 1
1358.5123	A		0.02	9.15	1–2	
1302.1685‡	A		0.00	9.52	2–1	$2p^4\ ^3P - 3s\ ^3S°$ UV 2
1304.8576	A		0.02	9.52	1–1	
1306.0286	A		0.03	9.52	0–1	
1047.376	P		0.00	11.84	2–2	$2p^4\ ^3P - 4s\ ^5S°$ UV 2.01
1049.115	P		0.02	11.84	1–2	
1039.2304	A		0.00	11.93	2–1	$2p^4\ ^3P - 4s\ ^3S°$ UV 3
1040.9425	A		0.02	11.93	1–1	
1041.6876	A		0.03	11.93	0–1	
1026.476	P		0.00	12.08	2–3	$2p^4\ ^3P - 3d\ ^5D°$ UV 3.01
1028.145	P		0.02	12.08	1–2	
1028.870	P		0.03	12.08	0–1	
1025.7618	A		0.00	12.09	2–	$2p^4\ ^3P - 3d\ ^3D°$ UV 4
1027.4307	A		0.02	12.09	1–	
1028.1571	A		0.03	12.09	0–1	
988.7734	A		0.00	12.54	2–3	$2p^4\ ^3P - 3s'\ ^3D°$ UV 5
990.2043	A		0.02	12.54	1–2	
990.8010	A		0.03	12.54	0–1	
988.6549	A		0.00	12.54	2–2	
990.1269	A		0.02	12.54	1–1	
988.5778	A		0.00	12.54	2–1	
979.272	P		0.00	12.66	2–2	$2p^4\ ^3P - 5s\ ^5S°$ UV 6
980.792	P		0.02	12.66	1–2	
976.4481	A		0.00	12.70	2–1	$2p^4\ ^3P - 5s\ ^3S°$ UV 7
977.9594	A		0.02	12.70	1–1	
978.6170	A		0.03	12.70	0–1	
974.070	P		0.00	12.73	2–2	$2p^4\ ^3P - 3s'\ ^1D°$ UV 8
975.574	P		0.02	12.73	1–2	
972.143	P		0.00	12.75	2–3	$2p^4\ ^3P - 4d\ ^5D°$ UV 9
973.640	P		0.02	12.75	1–2	
974.292	P		0.03	12.75	0–1	
971.7381	A		0.00	12.76	2–	$2p^4\ ^3P - 4d\ ^3D°$ UV 10
973.2342	A		0.02	12.76	1–	
973.8852	A		0.03	12.76	0–1	
950.8846	A	(3)	0.00	13.04	2–1	$2p^4\ ^3P - 6s\ ^3S°$ UV 11
952.3178	A	(1)	0.02	13.04	1–1	
952.9413	A	(1)	0.03	13.04	0–1	

O I

I A	Ref.	Int.	E P Low	E P High	J	Multiplet No.
Vac						
948.6855	A		0.00	13.07	2–	$2p^4\ ^3P - 5d\ ^3D°$ UV 12
950.1121	A	(2)	0.02	13.07	1–	
950.7327	A		0.03	13.07	0–1	
937.8405	A		0.00	13.22	2–1	$2p^4\ ^3P - 7s\ ^3S°$ UV 13
939.2346	A		0.02	13.22	1–1	
939.8412	A	(2)	0.03	13.22	0–1	
936.6295	A	(3)	0.00	13.24	2–	$2p^4\ ^3P - 6d\ ^3D°$ UV 14
938.0200	A	(2)	0.02	13.24	1–	
938.6249	A		0.03	13.24	0–1	
930.2566	A	(2)	0.00	13.33	2–1	$2p^4\ ^3P - 8s\ ^3S°$ UV 15
931.6282	A	(2)	0.02	13.33	1–1	
932.2249	A		0.03	13.33	0–1	
929.5168	A	(3)	0.00	13.34	2–	$2p^4\ ^3P - 7d\ ^3D°$ UV 16
930.8862	A	(2)	0.02	13.34	1–	
931.4820	A	(2)	0.03	13.34	0–1	
925.442	E	(2)	0.00	13.40	2–1	$2p^4\ ^3P - 9s\ ^3S°$ UV 17
926.809	E	(2)	0.02	13.40	1–1	
927.394	P		0.03	13.40	0–1	
924.952	E	(2)	0.00	13.40	2–	$2p^4\ ^3P - 8d\ ^3D°$ UV 18
926.295	E	(3)	0.02	13.40	1–	
926.903	E	(2)	0.03	13.40	0–1	
922.200	E	(2)	0.00	13.44	2–1	$2p^4\ ^3P - 10s\ ^3S°$ UV 19
923.549	P		0.02	13.44	1–1	
924.135	P		0.03	13.44	0–1	
921.860	E	(3)	0.00	13.45	2–	$2p^4\ ^3P - 9d\ ^3D°$ UV 20
923.200	E	(3)	0.02	13.45	1–	
923.790	P		0.03	13.45	0–1	
919.908	E	(2)	0.00	13.48	2–1	$2p^4\ ^3P - 11s\ ^3S°$ UV 21
921.247	E	(1)	0.02	13.48	1–1	
921.860	E	(3)	0.03	13.48	0–1	
919.658	E	(3)	0.00	13.48	2–	$2p^4\ ^3P - 10d\ ^3D°$ UV 22
921.005	E	(3)	0.02	13.48	1–	
921.575	E	(1)	0.03	13.48	0–1	
918.221	E	(2)	0.00	13.50	2–1	$2p^4\ ^3P - 12s\ ^3S°$ UV 23
919.559	E	(2)	0.02	13.50	1–1	
918.039	E	(3)	0.00	13.50	2–	$2p^4\ ^3P - 11d\ ^3D°$ UV 24
919.376	E	(2)	0.02	13.50	1–	
919.971	E	(1)	0.03	13.50	0–1	
916.960	E	(2)	0.00	13.52	2–1	$2p^4\ ^3P - 13s\ ^3S°$ UV 25
918.293	P		0.02	13.52	1–1	
916.816	E	(3)	0.00	13.52	2–	$2p^4\ ^3P - 12d\ ^3D°$ UV 26
918.149	E	(2)	0.02	13.52	1–	
918.724	E	(1)	0.03	13.52	0–1	
915.991	E	(2)	0.00	13.54	2–1	$2p^4\ ^3P - 14s\ ^3S°$ UV 27
917.315	E	(2)	0.02	13.54	1–1	

O I—Continued

I A	Ref.	Int.	E P Low	E P High	J	Multiplet No.
Vac						
915.877	E	(3)	0.00	13.54	2–	$2p^4\ ^3P - 13d\ ^3D°$
917.185	E	(2)	0.02	13.54	1–	UV 28
915.199	E	(1)	0.00	13.55	2–1	$2p^4\ ^3P - 15s\ ^3S°$
916.526	P		0.02	13.55	1–1	UV 29
915.100	E	(2)	0.00	13.55	2–	$2p^4\ ^3P - 14d\ ^3D°$
916.420	E	(3)	0.02	13.55	1–	UV 30
916.960	E	(2)	0.03	13.55	0–1	
914.588	E	(3)	0.00	13.56	2–1	$2p^4\ ^3P - 16s\ ^3S°$
915.877	E	(3)	0.02	13.56	1–1	UV 31
914.513	E	(3)	0.00	13.56	2–	$2p^4\ ^3P - 15d\ ^3D°$
915.821	E	(3)	0.02	13.56	1–	UV 32
914.057	E	(1)	0.00	13.56	2–1	$2p^4\ ^3P - 17s\ ^3S°$
915.381	P		0.02	13.56	1–1	UV 33
913.997	E	(4)	0.00	13.56	2–	$2p^4\ ^3P - 16d\ ^3D°$
915.321	E	(2)	0.02	13.56	1–	UV 34
913.644	E	(3)	0.00	13.57	2–1	$2p^4\ ^3P - 18s\ ^3S°$
*914.918	E	(2)	0.02	13.57	1–1	UV 35
913.590	E	(3)	0.00	13.57	2–	$2p^4\ ^3P - 17d\ ^3D°$
*914.918	E	(2)	0.02	13.57	1–	UV 36
915.499	E	(1)	0.03	13.57	0–1	
*913.250	E	(4)	0.00	13.58	2–	$2p^4\ ^3P - 18d\ ^3D°$
914.588	E	(3)	0.02	13.58	1–	UV 37
915.199	E	(1)	0.03	13.58	0–1	
*913.250	E	(4)	0.00	13.58	2–1	$2p^4\ ^3P - 19s\ ^3S°$ UV 38
*912.964	E	(4)	0.00	13.58	2–	$2p^4\ ^3P - 19d\ ^3D°$
914.293	E	(2)	0.02	13.58	1–	UV 39
914.854	E	(1)	0.03	13.58	0–1	
*912.964	E	(4)	0.00	13.58	2–1	$2p^4\ ^3P - 20s\ ^3S°$ UV 40
*912.723	E	(4)	0.00	13.58	2–	$2p^4\ ^3P - 20d\ ^3D°$
914.057	E	(3)	0.02	13.58	1–	UV 41
*912.723	E	(4)	0.00	13.58	2–1	$2p^4\ ^3P - 21s\ ^3S°$ UV 42
*912.500	E	(3)	0.00	13.59	2–1	$2p^4\ ^3P - 22s\ ^3S°$ UV 43
*912.500	E	(3)	0.00	13.59	2–	$2p^4\ ^3P - 21d\ ^3D°$
913.815	E	(3)	0.02	13.59	1–	UV 44
*912.318	E	(3)	0.00	13.59	2–1	$2p^4\ ^3P - 23s\ ^3S°$ UV 45

O I—Continued

I A	Ref.	Int.	E P Low	E P High	J	Multiplet No.
Vac						
*912.318	E	(3)	0.00	13.59	2–	$2p^4\ ^3P - 22d\ ^3D°$
913.644	E	(3)	0.02	13.59	1–	UV 46
*912.155	E	(3)	0.00	13.59	2–1	$2p^4\ ^3P - 24s\ ^3S°$ UV 47
*912.155	E	(3)	0.00	13.59	2–	$2p^4\ ^3P - 23d\ ^3D°$
913.483	E	(3)	0.02	13.59	1–	UV 48
*912.012	E	(3)	0.00	13.59	2–1	$2p^4\ ^3P - 25s\ ^3S°$ UV 49
*912.012	E	(3)	0.00	13.59	2–	$2p^4\ ^3P - 24d\ ^3D°$ UV 50
*911.898	E	(2)	0.00	13.60	2–1	$2p^4\ ^3P - 26s\ ^3S°$ UV 51
*911.898	E	(2)	0.00	13.60	2–	$2p^4\ ^3P - 25d\ ^3D°$ UV 52
*911.786	E	(2)	0.00	13.60	2–1	$2p^4\ ^3P - 27s\ ^3S°$ UV 53
*911.786	E	(2)	0.00	13.60	2–	$2p^4\ ^3P - 26d\ ^3D°$
913.127	E	(2)	0.02	13.60	1–	UV 54
*911.692	E	(2)	0.00	13.60	2–1	$2p^4\ ^3P - 28s\ ^3S°$ UV 55
*911.692	E	(2)	0.00	13.60	2–	$2p^4\ ^3P - 27d\ ^3D°$ UV 56
*911.611	E	(2)	0.00	13.60	2–1	$2p^4\ ^3P - 29s\ ^3S°$ UV 57
*911.611	E	(2)	0.00	13.60	2–	$2p^4\ ^3P - 28d\ ^3D°$ UV 58
*911.538	E	(2)	0.00	13.60	2–1	$2p^4\ ^3P - 30s\ ^3S°$ UV 59
*911.538	E	(2)	0.00	13.60	2–	$2p^4\ ^3P - 29d\ ^3D°$
912.843	E	(3)	0.02	13.60	1–	UV 60
*911.463	E	(1)	0.00	13.60	2–1	$2p^4\ ^3P - 31s\ ^3S°$ UV 61
*911.463	E	(1)	0.00	13.60	2–	$2p^4\ ^3P - 30d\ ^3D°$ UV 62
877.8787	A	(7)	0.00	14.12	2–2	$2p^4\ ^3P - 3s''\ ^3P°$
879.0194	A	(4)	0.02	14.12	1–1	UV 63
877.7983	A	(8)	0.00	14.12	2–1	
878.9720	A	(4)	0.02	14.12	1–0	
879.1001	A	(4)	0.02	14.12	1–2	
879.5507	A	(5)	0.03	14.12	0–1	

O I—Continued

I A	Ref.	Int.	E P Low	E P High	J	Multiplet No.
Vac						
862.678	P		0.00	14.37	2–1	$2p^4\ ^3P - 3s''\ ^1P°$
863.857	P		0.02	14.37	1–1	UV 64
864.370	P		0.03	14.37	0–1	
816.862	E	(9)	0.00	15.18	2–3	$2p^4\ ^3P - 4s'\ ^3D°$
817.835	E	(7)	0.02	15.18	1–2	UV 65
818.236	E	(7)	0.03	15.18	0–1	
816.766	E	(9)	0.00	15.18	2–2	
817.777	E	(7)	0.02	15.18	1–1	
811.0512	A		0.00	15.29	2–2	$2p^4\ ^3P - 3d'\ ^3P°$
811.7064	A		0.02	15.29	1–1	UV 66
810.6650	A		0.00	15.29	2–1	
811.4968	A		0.02	15.30	1–0	
812.0936	A		0.02	15.29	1–2	
812.1594	A		0.03	15.29	0–1	
804.848	E	(7)	0.00	15.40	2–3	$2p^4\ ^3P - 3d'\ ^3D°$
805.810	E	(8)	0.02	15.41	1–2	UV 67
806.231	E	(4)	0.03	15.41	0–1	
804.775	E	(6)	0.00	15.41	2–2	
805.745	E	(3)	0.02	15.41	1–1	
804.267	E	(9)	0.00	15.42	2–1	$2p^4\ ^3P - 3d'\ ^3S°$
805.295	E	(7)	0.02	15.42	1–1	UV 68
805.745	E	(3)	0.03	15.42	0–1	
791.9732	A	(7)	0.00	15.65	2–2	$2p^4\ ^3P - 2p^5\ ^3P°$
792.5063	A	(4)	0.02	15.66	1–1	UV 69
791.5136	A	(5)	0.00	15.66	2–1	
792.2330	A	(4)	0.02	15.67	1–0	
792.9671	A	(6)	0.02	15.65	1–2	
792.9381	A	(6)	0.03	15.66	0–1	
775.321	E	(7)	0.00	15.99	2–3	$2p^4\ ^3P - 5s'\ ^3D°$
776.206	E	(5)	0.02	15.99	1–2	UV 70
776.569	E	(4)	0.03	15.99	0–1	
775.252	E	(6)	0.00	15.99	2–2	
776.159	E	(5)	0.02	15.99	1–1	
771.056	E	(9)	0.00	16.08	2–3	$2p^4\ ^3P - 4d'\ ^3D°$
771.967	E	(6)	0.02	16.08	1–2	UV 71
772.344	E	(4)	0.03	16.08	0–1	
770.793	E	(7)	0.00	16.08	2–1	$2p^4\ ^3P - 4d'\ ^3S°$
771.729	E	(5)	0.02	16.08	1–1	UV 72
772.147	E	(2)	0.03	16.08	0–1	
769.4083	A		0.00	16.11	2–2	$2p^4\ ^3P - 4d'\ ^3P°$
770.2907	A		0.02	16.11	1–1	UV 73
769.3528	A		0.00	16.11	2–1	
770.2600	A		0.02	16.12	1–0	
770.3464	A		0.02	16.11	1–2	
*770.6986	A		0.03	16.11	0–1	
758.412	E	(5)	0.00	16.35	2–3	$2p^4\ ^3P - 6s'\ ^3D°$
759.262	E	(4)	0.02	16.35	1–2	UV 74
759.593	E	(3)	0.03	16.35	0–1	
758.347	E	(4)	0.00	16.35	2–2	
759.200	E	(3)	0.02	16.35	1–1	

O I—Continued

I A	Ref.	Int.	E P Low	E P High	J	Multiplet No.
Vac						
756.410	E	(6)	0.00	16.39	2–3	$2p^4\ ^3P - 5d'\ ^3D°$
757.254	E	(4)	0.02	16.39	1–2	UV 75
757.627	E	(3)	0.03	16.39	0–1	
756.354	E	(5)	0.00	16.39	2–2	
756.243	E	(6)	0.00	16.39	2–1	$2p^4\ ^3P - 5d'\ ^3S°$
*757.149	E	(3)	0.02	16.39	1–1	UV 76
755.790	E	(6)	0.00	16.40	2–2	$2p^4\ ^3P - 5d'\ ^3P°$
756.676	E	(4)	0.02	16.40	1–	UV 77
756.704	E	(3)	0.02	16.40	1–2	
757.059	E	(3)	0.03	16.40	0–1	
749.795	E	(3)	0.00	16.54	2–3	$2p^4\ ^3P - 7s'\ ^3D°$
750.637	E	(3)	0.02	16.54	1–2	UV 78
750.956	E	(3)	0.03	16.54	0–1	
749.742	E	(3)	0.00	16.54	2–2	
750.573	E	(2)	0.02	16.54	1–1	
748.680	E	(5)	0.00	16.56	2–3	$2p^4\ ^3P - 6d'\ ^3D°$
749.586	E	(3)	0.02	16.56	1–2	UV 79
748.632	E	(5)	0.00	16.56	2–1	$2p^4\ ^3P - 6d'\ ^3S°$
749.517	E	(3)	0.02	16.56	1–1	UV 80
749.894	E	(2)	0.03	16.56	0–1	
748.380	E	(6)	0.00	16.57	2–2	$2p^4\ ^3P - 6d'\ ^3P°$
749.253	E	(6)	0.02	16.57	1–	UV 81
749.628	E	(3)	0.03	16.57	0–1	
*744.794	E	(7)	0.00	16.65	2–3	$2p^4\ ^3P - 8s'\ ^3D°$
745.628	E	(2)	0.02	16.65	1–2	UV 82
745.945	E	(2)	0.03	16.65	0–1	
744.128	E	(5)	0.00	16.66	2–	$2p^4\ ^3P - 7d'\ ^3D°$
745.011	E	(3)	0.02	16.66	1–	UV 83
744.051	E	(6)	0.00	16.66	2–1	$2p^4\ ^3P - 7d'\ ^3S°$
744.899	E	(3)	0.02	16.66	1–1	UV 84
745.287	E	(2)	0.03	16.66	0–1	
743.929	E	(5)	0.00	16.67	2–2	$2p^4\ ^3P - 7d'\ ^3P°$
*744.794	E	(7)	0.02	16.67	1–	UV 85
745.159	E	(3)	0.03	16.67	0–1	
741.625	E	(4)	0.00	16.72	2–3	$2p^4\ ^3P - 9s'\ ^3D°$
742.471	E	(2)	0.02	16.72	1–2	UV 86
*741.177	E	(6)	0.00	16.73	2–	$2p^4\ ^3P - 8d'\ ^3D°$
*742.062	E	(3)	0.02	16.73	1–	UV 87
*741.177	E	(6)	0.00	16.73	2–1	$2p^4\ ^3P - 8d'\ ^3S°$
*742.062	E	(3)	0.02	16.73	1–1	UV 88
741.055	E	(5)	0.00	16.73	2–2	$2p^4\ ^3P - 8d'\ ^3P°$
741.914	E	(4)	0.02	16.73	1–	UV 89
742.280	E	(3)	0.03	16.73	0–1	
739.499	E	(3)	0.00	16.77	2–3	$2p^4\ ^3P - 10s'\ ^3D°$
						UV 90

O I—Continued

I A	Ref.	Int.	E P Low	E P High	J	Multiplet No.
Vac						
*739.188	E	(5)	0.00	16.77	2–	$2p^4\ ^3P - 9d'\ ^3D^\circ$
*740.053	E	(3)	0.02	16.77	1–	UV 91
*739.188	E	(5)	0.00	16.77	2–1	$2p^4\ ^3P - 9d'\ ^3S^\circ$
*740.053	E	(3)	0.02	16.77	1–1	UV 92
739.085	E	(4)	0.00	16.78	2–2	$2p^4\ ^3P - 9d'\ ^3P^\circ$
739.940	E	(4)	0.02	16.78	1–	UV 93
740.313	E	(0)	0.03	16.78	0–1	
737.995	E	(3)	0.00	16.80	2–3	$2p^4\ ^3P - 11s'\ ^3D^\circ$ UV 94
*737.779	E	(5)	0.00	16.80	2–	$2p^4\ ^3P - 10d'\ ^3D^\circ$
*738.644	E	(3)	0.02	16.80	1–	UV 95
*737.779	E	(5)	0.00	16.80	2–1	$2p^4\ ^3P - 10d'\ ^3S^\circ$
*738.644	E	(3)	0.02	16.80	1–1	UV 96
737.683	E	(3)	0.00	16.81	2–2	$2p^4\ ^3P - 10d'\ ^3P^\circ$
738.537	E	(4)	0.02	16.81	1–	UV 97
738.906	E	(2)	0.03	16.81	0–1	
737.019	E	(2)	0.00	16.82	2–	$2p^4\ ^3P - 4s''\ ^3P^\circ$ UV 98
736.910	E	(3)	0.00	16.82	2–3	$2p^4\ ^3P - 12s'\ ^3D^\circ$ UV 99
*736.734	E	(5)	0.00	16.83	2–	$2p^4\ ^3P - 11d'\ ^3D^\circ$
*737.614	E	(3)	0.02	16.83	1–	UV 100
*736.734	E	(5)	0.00	16.83	2–1	$2p^4\ ^3P - 11d'\ ^3S^\circ$
*737.614	E	(3)	0.02	16.83	1–1	UV 101
736.629	E	(3)	0.00	16.83	2–	$2p^4\ ^3P - 11d'\ ^3P^\circ$
737.495	E	(4)	0.02	16.83	1–	UV 102
737.873	E	(3)	0.03	16.83	0–1	
736.092	E	(3)	0.00	16.84	2–3	$2p^4\ ^3P - 13s'\ ^3D^\circ$ UV 103
*735.960	E	(4)	0.00	16.85	2–	$2p^4\ ^3P - 12d'\ ^3D^\circ$
*736.824	E	(3)	0.02	16.85	1–	UV 104
*735.960	E	(4)	0.00	16.85	2–1	$2p^4\ ^3P - 12d'\ ^3S^\circ$
*736.824	E	(3)	0.02	16.85	1–1	UV 105
735.840	E	(2)	0.00	16.85	2–	$2p^4\ ^3P - 12d'\ ^3P^\circ$
737.083	E	(3)	0.03	16.85	0–1	UV 106
*735.367	E	(4)	0.00	16.86	2–	$2p^4\ ^3P - 13d'\ ^3D^\circ$
*736.225	E	(3)	0.02	16.86	1–	UV 107
*735.367	E	(4)	0.00	16.86	2–1	$2p^4\ ^3P - 13d'\ ^3S^\circ$
*736.225	E	(3)	0.02	16.86	1–1	UV 108
735.234	E	(3)	0.00	16.86	2–	$2p^4\ ^3P - 13d'\ ^3P^\circ$
736.092	E	(3)	0.02	16.86	1–	UV 109
736.460	E	(2)	0.03	16.86	0–1	

O I—Continued

I A	Ref.	Int.	E P Low	E P High	J	Multiplet No.
Vac						
*734.913	E	(4)	0.00	16.87	2–	$2p^4\ ^3P - 14d'\ ^3D^\circ$
*735.760	E	(2)	0.02	16.87	1–	UV 110
*734.913	E	(4)	0.00	16.87	2–1	$2p^4\ ^3P - 14d'\ ^3S^\circ$
*735.760	E	(2)	0.02	16.87	1–1	UV 111
734.746	E	(2)	0.00	16.87	2–	$2p^4\ ^3P - 14d'\ ^3P^\circ$
735.616	E	(3)	0.02	16.87	1–	UV 112
*734.544	E	(3)	0.00	16.88	2–	$2p^4\ ^3P - 15d'\ ^3D^\circ$ UV 113
*734.544	E	(3)	0.00	16.88	2–1	$2p^4\ ^3P - 15d'\ ^3S^\circ$ UV 114
734.368	E	(2)	0.00	16.88	2–2	$2p^4\ ^3P - 15d'\ ^3P^\circ$ UV 115
*734.251	E	(3)	0.00	16.89	2–	$2p^4\ ^3P - 16d'\ ^3D^\circ$
*735.092	E	(2)	0.02	16.89	1–	UV 116
*734.251	E	(3)	0.00	16.89	2–1	$2p^4\ ^3P - 16d'\ ^3S^\circ$
*735.092	E	(2)	0.02	16.89	1–1	UV 117
733.987	E	(2)	0.00	16.89	2–2	$2p^4\ ^3P - 16d'\ ^3P^\circ$ UV 118
724.932	E	(5)	0.00	17.10	2–	$2p^4\ ^3P - 3d''\ ^3P^\circ$
725.748	E	(4)	0.02	17.10	1–	UV 119
726.104	E	(3)	0.03	17.10	0–1	
724.830	E	(6)	0.00	17.10	2–	$2p^4\ ^3P - 3d''\ ^3D^\circ$
725.665	E	(5)	0.02	17.10	1–	UV 120
726.035	E	(3)	0.03	17.10	0–1	
701.014	E	(2)	0.00	17.69	2–	$2p^4\ ^3P - 5s''\ ^3P^\circ$ UV 121
697.532	E	(6)	0.00	17.77	2–	$2p^4\ ^3P - 4d''\ ^3P^\circ$
698.297	E	(4)	0.02	17.77	1–	UV 122 $^3D^\circ$
698.631	E	(3)	0.03	17.77	0–1	
687.202	E	(4)	0.00	18.04	2–	$2p^4\ ^3P - 6s''\ ^3P^\circ$
687.997	E	(2)	0.02	18.04	1–	UV 123
688.245	E	(2)	0.03	18.04	0–	
685.544	E	(7)	0.00	18.09	2–	$2p^4\ ^3P - 5d''\ ^3P^\circ$
686.284	E	(5)	0.02	18.09	1–	UV 124 $^3D^\circ$
686.603	E	(3)	0.03	18.09	0–1	
680.146	E	(2)	0.00	18.23	2–	$2p^4\ ^3P - 7s''\ ^3P^\circ$
680.866	E	(2)	0.02	18.23	1–	UV 125
679.202	E	(4)	0.00	18.25	2–	$2p^4\ ^3P - 6d''\ ^3P^\circ$
679.948	E	(4)	0.02	18.25	1–	UV 126 $^3D^\circ$
680.256	E	(2)	0.03	18.25	0–1	
676.033	E	(2)	0.00	18.34	2–	$2p^4\ ^3P - 8s''\ ^3P^\circ$
676.763	E	(1)	0.02	18.34	1–	UV 127

O I—Continued

I A	Ref.	Int.	E P Low	E P High	J	Multiplet No.
Vac						
675.463	E	(5)	0.00	18.36	2–	$2p^4\ {}^3P - 7d''\ {}^3P°$
676.183	E	(3)	0.02	18.36	1–	UV 128 $^3D°$
676.487	E	(2)	0.03	18.36	0–1	
673.421	E	(2)	0.00	18.41	2–	$2p^4\ {}^3P - 9s''\ {}^3P°$ UV 129
673.052	E	(5)	0.00	18.42	2–	$2p^4\ {}^3P - 8d''\ {}^3P°$ UV 130 $^3D°$
671.669	E	(2)	0.00	18.46	2–	$2p^4\ {}^3P - 10s''\ {}^3P°$ UV 131
671.406	E	(5)	0.00	18.47	2–	$2p^4\ {}^3P - 9d''\ {}^3P°$
672.090	E	(3)	0.02	18.47	1–	UV 132 $^3D°$
672.404	E	(2)	0.03	18.47	0–1	
*670.425	E	(2)	0.00	18.49	2–	$2p^4\ {}^3P - 11s''\ {}^3P°$ UV 133
670.237	E	(4)	0.00	18.50	2–	$2p^4\ {}^3P - 10d''\ {}^3P°$
670.952	E	(3)	0.02	18.50	1–	UV 134 $^3D°$
669.526	E	(2)	0.00	18.52	2–	$2p^4\ {}^3P - 12s''\ {}^3P°$ UV 135
669.371	E	(4)	0.00	18.52	2–	$2p^4\ {}^3P - 11d''\ {}^3P°$
670.091	E	(2)	0.02	18.52	1–	UV 136 $^3D°$
*670.425	E	(2)	0.03	18.52	0–1	
668.832	E	(1)	0.00	18.54	2–	$2p^4\ {}^3P - 13s''\ {}^3P°$ UV 137
668.720	E	(4)	0.00	18.54	2–	$2p^4\ {}^3P - 12d''\ {}^3P°$ UV 138 $^3D°$
668.307	E	(1)	0.00	18.55	2–	$2p^4\ {}^3P - 14s''\ {}^3P°$ UV 139
668.211	E	(3)	0.00	18.55	2–	$2p^4\ {}^3P - 13d''\ {}^3P°$
668.928	E	(1)	0.02	18.55	1–	UV 140 $^3D°$
668.509	E	(2)	0.02	18.57	1–	$2p^4\ {}^3P - 14d''\ {}^3P°$ UV 141 $^3D°$
667.487	E	(3)	0.00	18.57	2–	$2p^4\ {}^3P - 15d''\ {}^3P°$ UV 142 $^3D°$
667.006	E	(3)	0.00	18.59	2–	$2p^4\ {}^3P - 17d''\ {}^3P°$ UV 143 $^3D°$
666.838	E	(2)	0.00	18.59	2–	$2p^4\ {}^3P - 18d''\ {}^3P°$ UV 144 $^3D°$
666.663	E	(1)	0.00	18.60	2–	$2p^4\ {}^3P - 19d''\ {}^3P°$ UV 145 $^3D°$
Air						
5577.339	D		1.96	4.19	2–0	$2p^4\ {}^1D - 2p^4\ {}^1S$ 3F

O I—Continued

I A	Ref.	Int.	E P Low	E P High	J	Multiplet No.
Vac						
1641.305	P		1.96	9.52	2–1	$2p^4\ {}^1D - 3s\ {}^1S°$ UV 146
1240.377	P		1.96	12.09	2–3	$2p^4\ {}^1D - 3d\ {}^1D°$
1240.378	P		1.96	12.09	2–2	UV 147
1240.379	P		1.96	12.09	2–1	
1152.1512	A		1.96	12.73	2–2	$2p^4\ {}^1D - 3s'\ {}^1D°$ UV 148
999.4974	A		1.96	14.37	2–1	$2p^4\ {}^1D - 3s''\ {}^1P°$ UV 149
935.1930	A	(9)	1.96	15.22	2–2	$2p^4\ {}^1D - 4s'\ {}^1D°$ UV 150
922.46	F	(2)	1.96	15.41	2–1	$2p^4\ {}^1D - 3d'\ {}^1P°$ UV 151
922.0727	A	(4)	1.96	15.41	2–2	$2p^4\ {}^1D - 3d'\ {}^1D°$ UV 152
922.0081	A	(8)	1.96	15.41	2–3	$2p^4\ {}^1D - 3d'\ {}^1F°$ UV 153
882.8895	A	(6)	1.96	16.01	2–2	$2p^4\ {}^1D - 5s'\ {}^1D°$ UV 154
878.62	F	(0)	1.96	16.08	2–1	$2p^4\ {}^1D - 4d'\ {}^1P°$ UV 155
878.25	F	(3)	1.96	16.08	2–2	$2p^4\ {}^1D - 4d'\ {}^1D°$ UV 156
878.2007	A	(4)	1.96	16.08	2–3	$2p^4\ {}^1D - 4d'\ {}^1F°$ UV 157
861.56	F	(6)	1.96	16.36	2–2	$2p^4\ {}^1D - 6s'\ {}^1D°$ UV 158
859.59	F	(1)	1.96	16.39	2–1	$2p^4\ {}^1D - 5d'\ {}^1P°$ UV 159
859.35	F	(3)	1.96	16.39	2–2	$2p^4\ {}^1D - 5d'\ {}^1D°$ UV 160
859.31	F	(4)	1.96	16.40	2–3	$2p^4\ {}^1D - 5d'\ {}^1F°$ UV 161
850.68	F	(2)	1.96	16.54	2–2	$2p^4\ {}^1D - 7s'\ {}^1D°$ UV 162
849.61	F	(2)	1.96	16.56	2–1	$2p^4\ {}^1D - 6d'\ {}^1P°$ UV 163
849.48	F	(1)	1.96	16.56	2–2	$2p^4\ {}^1D - 6d'\ {}^1D°$ UV 164

O I—Continued

I A	Ref.	Int.	E P Low	E P High	J	Multiplet No.
Vac 849.45	F	(0)	1.96	16.56	2-3	$2p^4\ ^1D - 6d'\ ^1F^\circ$ UV 165
844.53	F	(0)	1.96	16.65	2-2	$2p^4\ ^1D - 8s'\ ^3D^\circ$ UV 166
844.33	F	(0)	1.96	16.65	2-2	$2p^4\ ^1D - 8s'\ ^1D^\circ$ UV 167
843.75	F	(1)	1.96	16.66	2-1	$2p^4\ ^1D - 7d'\ ^1P^\circ$ UV 168
843.59	F	(1)	1.96	16.66	2-2 -3	$2p^4\ ^1D - 7d'\ ^1D^\circ$ UV 169 $^1F^\circ$
840.49	F	(0)	1.96	16.72	2-2	$2p^4\ ^1D - 9s'\ ^3D^\circ$ UV 170
840.33	F	(0)	1.96	16.72	2-2	$2p^4\ ^1D - 9s'\ ^1D^\circ$ UV 171
839.96	F	(1)	1.96	16.73	2-1	$2p^4\ ^1D - 8d'\ ^1P^\circ$ UV 172
839.83	F	(1)	1.96	16.73	2-2 -3	$2p^4\ ^1D - 8d'\ ^1D^\circ$ UV 173 $^1F^\circ$
837.76	F	(0)	1.96	16.77	2-2	$2p^4\ ^1D - 10s'\ ^3D^\circ$ UV 174
837.63	F	(0)	1.96	16.77	2-2	$2p^4\ ^1D - 10s'\ ^1D^\circ$ UV 175
837.40	F	(1)	1.96	16.77	2-1	$2p^4\ ^1D - 9d'\ ^1P^\circ$ UV 176
837.27	F	(1)	1.96	16.78	2-2 -3	$2p^4\ ^1D - 9d'\ ^1D^\circ$ UV 177 $^1F^\circ$
835.60	F	(1)	1.96	16.80	2-1	$2p^4\ ^1D - 10d'\ ^1P^\circ$ UV 178
835.44	F	(1)	1.96	16.81	2-2 -3	$2p^4\ ^1D - 10d'\ ^1D^\circ$ UV 179 $^1F^\circ$
834.34	F	(0)	1.96	16.83	2-2	$2p^4\ ^1D - 12s'\ ^1D^\circ$? UV 180
834.25	F	(0)	1.96	16.83	2-1	$2p^4\ ^1D - 11d'\ ^1P^\circ$ UV 181
834.12	F	(0)	1.96	16.83	2-2 -3	$2p^4\ ^1D - 11d'\ ^1D^\circ$ UV 182 $^1F^\circ$
833.20	F	(0)	1.96	16.85	2-1	$2p^4\ ^1D - 12d'\ ^1P^\circ$ UV 183
833.10	F	(0)	1.96	16.85	2-2 -3	$2p^4\ ^1D - 12d'\ ^1D^\circ$ UV 184 $^1F^\circ$
*832.42	F	(0)	1.96	16.86	2-2	$2p^4\ ^1D - 14s'\ ^1D^\circ$ UV 185

O I—Continued

I A	Ref.	Int.	E P Low	E P High	J	Multiplet No.
Vac *832.42	F	(0)	1.96	16.86	2-1	$2p^4\ ^1D - 13d'\ ^1P^\circ$ UV 186
831.83	F	(0)	1.96	16.87	2-1	$2p^4\ ^1D - 14d'\ ^1P^\circ$ UV 187
829.98	F	(1)	1.96	16.91	2-1	$2p^4\ ^1D - 4s''\ ^1P^\circ$ UV 188
819.27	F	(3)	1.96	17.10	2-2	$2p^4\ ^1D - 3d''\ ^1D^\circ$ UV 189
788.18	F	(1)	1.96	17.70	2-1	$2p^4\ ^1D - 5s''\ ^1P^\circ$ UV 190
784.37	F	(2)	1.96	17.77	2-2	$2p^4\ ^1D - 4d''\ ^1D^\circ$ UV 191
*770.70	F	(?)	1.96	18.05	2-1	$2p^4\ ^1D - 6s''\ ^1P^\circ$ UV 192
769.23	F	(2)	1.96	18.08	2-2	$2p^4\ ^1D - 5d''\ ^1D^\circ$ UV 193
762.26	F	(1)	1.96	18.23	2-1	$2p^4\ ^1D - 7s''\ ^1P^\circ$ UV 194
761.26	F	(1)	1.96	18.25	2-2	$2p^4\ ^1D - 6d''\ ^1D^\circ$ UV 195
757.15	F	(1)	1.96	18.34	2-1	$2p^4\ ^1D - 8s''\ ^1P^\circ$ UV 196
756.56	F	(0)	1.96	18.35	2-2	$2p^4\ ^1D - 7d''\ ^1D^\circ$ UV 197
753.94	F	(0)	1.96	18.41	2-1	$2p^4\ ^1D - 9s''\ ^1P^\circ$ UV 198
753.52	F	(1)	1.92	18.42	2-2	$2p^4\ ^1D - 8d''\ ^1D^\circ$ UV 199
751.75	F	(0)	1.96	18.46	2-1	$2p^4\ ^1D - 10s''\ ^1P^\circ$ UV 200
751.47	F	(1)	1.96	18.47	2-2	$2p^4\ ^1D - 9d''\ ^1D^\circ$ UV 201
750.19	F	(1)	1.96	18.49	2-1	$2p^4\ ^1D - 11s''\ ^1P^\circ$ UV 202
749.99	F	(0)	1.96	18.50	2-2	$2p^4\ ^1D - 10d''\ ^1D^\circ$ UV 203
748.93	F	(0)	1.96	18.52	2-2	$2p^4\ ^1D - 11d''\ ^1D^\circ$ UV 204

O I—Continued

I A	Ref.	Int.	E P Low	E P High	J	Multiplet No.
Air						
2324.738	P		4.19	9.52	0–1	$2p^4\ {}^1S - 3s\ {}^3S°$ UV 205
Vac						
1601.731	P		4.19	11.93	0–1	$2p^4\ {}^1S - 4s\ {}^3S°$ UV 206
1217.6477	A		4.19	14.37	0–1	$2p^4\ {}^1S - 3s''\ {}^1P°$ UV 207
1105.20	P		4.19	15.41	0–1	$2p^4\ {}^1S - 3d'\ {}^1P°$ UV 208
1042.86	P		4.19	16.08	0–1	$2p^4\ {}^1S - 4d'\ {}^1P°$ UV 209
975.04	P		4.19	16.91	0–1	$2p^4\ {}^1S - 4s''\ {}^1P°$ UV 210
959.80	F	(0)	4.19	17.11	0–1	$2p^4\ {}^1S - 3d''\ {}^1P°$ UV 211
912.48	F	(0)	4.19	17.78	0–1	$2p^4\ {}^1S - 4d''\ {}^1P°$ UV 212
892.11	F	(1)	4.19	18.09	0–1	$2p^4\ {}^1S - 5d''\ {}^1P°$ UV 213
881.47	F	(0)	4.19	18.25	0–1	$2p^4\ {}^1S - 6d''\ {}^1P°$ UV 214
875.16	F	(1)	4.19	18.36	0–1	$2p^4\ {}^1S - 7d''\ {}^1P°$ UV 215
871.16	F	(0)	4.19	18.42	0–1	$2p^4\ {}^1S - 8d''\ {}^1P°$ UV 216
868.41	F	(0)	4.19	18.47	0–1	$2p^4\ {}^1S - 9d''\ {}^1P°$ UV 217
Air						
7771.9436	B	28	9.15	10.74	2–3	$3s\ {}^5S° - 3p\ {}^5P$ 1
7774.1665	B	27	9.15	10.74	2–2	
7775.3884	B	26	9.15	10.74	2–1	
6726.2833	B	9	9.15	10.99	2–2	$3s\ {}^5S° - 3p\ {}^3P$ 2
6726.5389	B	6	9.15	10.99	2–1	
3947.2948	C	15	9.15	12.29	2–3	$3s\ {}^5S° - 4p\ {}^5P$ 3
3947.4812	C	14	9.15	12.29	2–2	
3947.5862	C	13	9.15	12.29	2–1	

O I—Continued

I A	Ref.	Int.	E P Low	E P High	J	Multiplet No.
Air						
3348.1776	C	8	9.15	12.85	2–3	$3s\ {}^5S° - 5p\ {}^5P$ 3.01
3348.2336	C	7	9.15	12.85	2–2	
3348.2737	C	6	9.15	12.85	2–1	
10167.252	B	10	9.52	10.74	1–2	$3s\ {}^3S° - 3p\ {}^5P$ 3.02
10169.347	P		9.52	10.74	1–1	
8446.3596	B	30	9.52	10.99	1–2	$3s\ {}^3S° - 3p\ {}^3P$ 4
8446.7581	B	29	9.52	10.99	1–1	
8446.250	B	27	9.52	10.99	1–0	
4368.2467	C	11	9.52	12.36	1–	$3s\ {}^3S° - 4p\ {}^3P$ 5
4368.1933	C	8	9.52	12.36	1–0	
3692.3945	A		9.52	12.88	1–2	$3s\ {}^3S° - 5p\ {}^3P$ 6
3692.3863	A		9.52	12.88	1–1	
3692.3558	A		9.52	12.88	1–0	
11302.376	B	23	10.74	11.84	3–2	$3p\ {}^5P - 4s\ {}^5S°$ 7
11297.682	B	22	10.74	11.84	2–2	
11295.104	B	21	10.74	11.84	1–2	
9266.006	B	24	10.74	12.08	3–4	$3p\ {}^5P - 3d\ {}^5D°$ 8
9262.774	B	23	10.74	12.08	2–3	
9260.935	B	20	10.74	12.08	1–2	
9265.938	B	21	10.74	12.08	3–3	
9262.671	B	22	10.74	12.08	2–2	
9260.845	B	21	10.74	12.08	1–1	
9265.827	P		10.74	12.08	3–2	
9262.584	B	19	10.74	12.08	2–1	
9260.806	B	20	10.74	12.08	1–0	
6455.9756	B	19	10.74	12.66	3–2	$3p\ {}^5P - 5s\ {}^5S°$ 9
6454.4451	B	18	10.74	12.66	2–2	
6453.6023	B	17	10.74	12.66	1–2	
6158.1835	B	21	10.74	12.75	3–	$3p\ {}^5P - 4d\ {}^5D°$ 10
6156.7658	B	20	10.74	12.75	2–	
6155.9756	B	19	10.74	12.75	1–	
5436.8616	B	11	10.74	13.02	3–2	$3p\ {}^5P - 6s\ {}^5S°$ 11
5435.7756	B	10	10.74	13.02	2–2	
5435.1767	B	9	10.74	13.02	1–2	
5330.7396	B	13	10.74	13.07	3–	$3p\ {}^5P - 5d\ {}^5D°$ 12
5329.6855	B	12	10.74	13.07	2–	
5329.1012	B	11	10.74	13.07	1–	
5020.2179	B	7	10.74	13.21	3–2	$3p\ {}^5P - 7s\ {}^5S°$ 13
5019.2910	B	6	10.74	13.21	2–2	
5018.7832	B	5	10.74	13.21	1–2	

O I—Continued

I A	Ref.	Int.	E P Low	E P High	J	Multiplet No.
Air						
4968.7931	B	8	10.74	13.24	3–	$3p\ {}^5P - 6d\ {}^5D^\circ$
4967.8821	B	7	10.74	13.24	2–	14
4967.3783	B	6	10.74	13.24	1–	
4802.9816	B	4	10.74	13.32	3–2	$3p\ {}^5P - 8s\ {}^5S^\circ$
4802.132	B	3	10.74	13.32	2–2	15
4773.7522	B	5	10.74	13.34	3–	$3p\ {}^5P - 7d\ {}^5D^\circ$
4772.9133	B	4	10.74	13.34	2–	16
4772.4489	B	3	10.74	13.34	1–	
4655.359	B	3	10.74	13.40	3–	$3p\ {}^5P - 8d\ {}^5D^\circ$
4654.5584	B	2	10.74	13.40	2–	18
4654.1183	B	1	10.74	13.40	1–	
13164.85	B	26	10.99	11.93	2–1	$3p\ {}^3P - 4s\ {}^3S^\circ$
13163.89	B	25	10.99	11.93	1–1	18.01
13165.11	B	24	10.99	11.93	0–1	
11286.914	B	24	10.99	12.09	2–3	$3p\ {}^3P - 3d\ {}^3D^\circ$
11286.344	B	23	10.99	12.09	1–	18.02
11287.318	B	21	10.99	12.09	0–1	
11287.022	B	21	10.99	12.09	2–	
7995.0742	B	15	10.99	12.54	2–3	$3p\ {}^3P - 3s'\ {}^3D^\circ$
7986.9777	B	13	10.99	12.54	1–2	19
7982.3986	B	11	10.99	12.54	0–1	
7987.3330	B	11	10.99	12.54	2–2	
7981.9414	B	10	10.99	12.54	1–1	
7254.4475	B	20	10.99	12.70	2–1	$3p\ {}^3P - 5s\ {}^3S^\circ$
7254.1544	B	19	10.99	12.70	1–1	20
7254.529	B	17	10.99	12.70	0–1	
7002.2282	B	20	10.99	12.76	2–	$3p\ {}^3P - 4d\ {}^3D^\circ$
7001.9157	B	18	10.99	12.76	1–	21
6046.4381	B	13	10.99	13.04	2–1	$3p\ {}^3P - 6s\ {}^3S^\circ$
6046.2329	B	12	10.99	13.04	1–1	22
6046.494	B	10	10.99	13.04	0–1	
5958.5830	B	13	10.99	13.07	2–	$3p\ {}^3P - 5d\ {}^3D^\circ$
5958.3868	B	12	10.99	13.07	1–	23
5555.0036	B	9	10.99	13.22	2–1	$3p\ {}^3P - 7s\ {}^3S^\circ$
5554.8322	B	8	10.99	13.22	1–1	24
5512.7709	B	8	10.99	13.24	2–	$3p\ {}^3P - 6d\ {}^3D^\circ$
5512.6030	B	7	10.99	13.24	1–	25
5299.0441	B	5	10.99	13.33	2–1	$3p\ {}^3P - 8s\ {}^3S^\circ$
5298.8876	B	4	10.99	13.33	1–1	26
5275.121	B	4	10.99	13.34	2–	$3p\ {}^3P - 7d\ {}^3D^\circ$
5274.9680	B	2	10.99	13.34	1–	27

O I—Continued

I A	Ref.	Int.	E P Low	E P High	J	Multiplet No.
Air						
3954.6073	A	11	10.99	14.12	2–2	$3p\ {}^3P - 3s''\ {}^3P^\circ$
3952.8870	A	5	10.99	14.12	1–1	30
*3952.9834	A	7	10.99	14.12	2–1	
3951.9271	A	8	10.99	14.12	1–0	
3954.5199	A	9	10.99	14.12	1–2	
*3952.9834	A	7	10.99	14.12	0–1	
2883.8557	A		10.99	15.29	2–2	$3p\ {}^3P - 3d'\ {}^3P^\circ$
2878.9312	A		10.99	15.29	1–1	30.01
2878.9776	A		10.99	15.29	2–1	
2876.2948	A		10.99	15.30	1–0	
2883.8092	A		10.99	15.29	1–2	
2878.9906	A		10.99	15.29	0–1	
9694.661	C	10	11.84	13.12	2–3	$4s\ {}^5S^\circ - 6p\ {}^5P$
9694.906	C	9	11.84	13.12	2–2	30.02
9695.060	C	8	11.84	13.12	2–1	
13076.91	C	14	11.93	12.88	1–	$4s\ {}^3S^\circ - 5p\ {}^3P$
						30.03
10320.304	C	9	11.93	13.13	1–	$4s\ {}^3S^\circ - 6p\ {}^3P$
						30.04
18021.21	B	23	12.08	12.77		$3d\ {}^5D^\circ - 4f\ {}^5F$
						30.05
12464.02	B	21	12.08	13.07		$3d\ {}^5D^\circ - 5f\ {}^5F$
						30.06
10675.725	B	17	12.08	13.24		$3d\ {}^5D^\circ - 6f\ {}^5F$
10675.940	B	16	12.08	13.24		30.07
9825.847	B	13	12.08	13.34		$3d\ {}^5D^\circ - 7f\ {}^5F$
9826.002	B	12	12.08	13.34		30.08
18243.63	B	22	12.09	12.77		$3d\ {}^3D^\circ - 4f\ {}^3F$
						30.09
12570.04	B	20	12.09	13.07		$3d\ {}^3D^\circ - 5f\ {}^3F$
						30.10
10753.530	B	17	12.09	13.24		$3d\ {}^3D^\circ - 6f\ {}^3F$
						30.11
9891.743	B	13	12.09	13.34		$3d\ {}^3D^\circ - 7f\ {}^3F$
						30.12

O I—Continued

I A	Ref.	Int.	E P Low	E P High	J	Multiplet No.
Air						
6324.842	A	7	12.09	14.05		$3d\ ^3D°-3p'\ ^3D$
6323.388	A	5	12.09	14.05	−1	31
3534.1883	A		12.09	15.59	3–3	$3d\ ^3D°-4p'\ ^3D$
3533.2532	A		12.09	15.59	2–2	31.01
3532.6054	A		12.09	15.60	1–1	
3533.2645	A		12.09	15.59	3–2	
3532.6141	A		12.09	15.60	2–1	
3534.1771	A		12.09	15.59	2–3	
3533.2445	A		12.09	15.59	1–2	
18229.23	C	13	12.36	13.04	−1	$4p\ ^3P-6s\ ^3S°$ 31.02
*7025.509	A	5	12.36	14.12	2–2	$4p\ ^3P-3s''\ ^3P°$
*7020.357	A	2	12.36	14.12	1–1	32
*7020.357	A	2	12.36	14.12	2–1	
*7025.509	A	5	12.36	14.12	1–2	
4233.2680	A	10	12.36	15.29	−2	$4p\ ^3P-3d'\ ^3P°$
4222.7651	A	8	12.36	15.29	−1	33
4217.0875	A	7	12.36	15.30	1–0	
4222.8182	A	7	12.36	15.29	0–1	
8221.823	A	22	12.54	14.05	3–	$3s'\ ^3D°-3p'\ ^3D$
8230.020	A	18	12.54	14.05	2–	34
8233.005	A	20	12.54	14.05	1–1	
8227.652	A	18	12.54	14.05	2–1	
8235.351	A	12	12.54	14.05	1–2	
7947.548	A	17	12.54	14.10	3–4	$3s'\ ^3D°-3p'\ ^3F$
7950.804	A	16	12.54	14.10	2–3	35
7952.160	A	15	12.54	14.10	1–2	
7943.153	A	11	12.54	14.10	3–3	
7947.169	A	11	12.54	14.10	2–2	
7939.514	A	6	12.54	14.10	3–2	
3823.4123	A	12	12.54	15.78	3–3	$3s'\ ^3D°-3p''\ ^3D$
3824.3509	A	7	12.54	15.78	2–2	36
3825.0221	A	7	12.54	15.78	1–1	
3822.5740	A	5	12.54	15.78	3–2	
3823.8686	A	6	12.54	15.78	2–1	
3825.1873	A	8	12.54	15.78	2–3	
3825.498	A		12.54	15.78	1–2	
9482.884	A	12*d*	12.73	14.04	2–1	$3s'\ ^1D°-3p'\ ^1P$ 36.01
9402.290	P		12.73	14.05	2–3	$3s'\ ^1D°-3p'\ ^3D$
9402.256	P		12.73	14.05	2–2	36.02
9399.192	A	15	12.73	14.05	2–1	
9039.607	A	8	12.73	14.10	2–3	$3s'\ ^1D°-3p'\ ^3F$
9034.912	P		12.73	14.10	2–2	36.03

O I—Continued

I A	Ref.	Int.	E P Low	E P High	J	Multiplet No.
Air						
8820.426	A	20	12.73	14.13	2–3	$3s'\ ^1D°-3p'\ ^1F$ 37
7156.701	A	16	12.73	14.46	2–2	$3s'\ ^1D°-3p'\ ^1D$ 38
3997.9528	A	4	12.73	15.83	2–1	$3s'\ ^1D°-3p''\ ^1P$ 38.01
3855.0141	A	6	12.73	15.94	2–2	$3s'\ ^1D°-3p''\ ^1D$ 38.02
*9625.290	A	12	12.76	14.05	3–3	$4d\ ^3D°-3p'\ ^3D$
*9625.290	A	12	12.76	14.05	2–2	38.03
*9622.127	A	11	12.76	14.05	1–1	
*9625.290	A	12	12.76	14.05	3–2	
*9622.127	A	11	12.76	14.05	2–1	
*9625.290	A	12	12.76	14.05	2–3	
*9625.290	A	12	12.76	14.05	1–2	
*26173.56	C	13	12.77	13.24		$4f\ ^5F-6g\ ^5G°$ 38.04
*26173.56	C	13	12.77	13.24		$4f\ ^3F-6g\ ^3G°$ 38.05
5146.096	A	7	12.88	15.29	−2	$5p\ ^3P-3d'\ ^3P°$
5130.586	A	5	12.88	15.29	−1	39
5122.229	A	4	12.88	15.30	1–0	
5130.655	A	5	12.88	15.29	0–1	
3830.3261	P		12.88	16.11	2–2	$5p\ ^3P-4d'\ ^3P°$
3830.3349	P		12.88	16.11	1–2	39.01
5750.57	P		13.13	15.29	−2	$6p\ ^3P-3d'\ ^3P°$
5731.21	P		13.13	15.29	−1	40
5720.77	P		13.13	15.30	−0	
10421.177	A	12*d*	14.04	15.22	1–2	$3p'\ ^1P-4s'\ ^1D°$ 40.01
9057.014	A	14*d*	14.04	15.40	1–0	$3p'\ ^1P-3d'\ ^1S°$ 40.02
8994.604	A	9*d*	14.04	15.41	1–2	$3p'\ ^1P-3d'\ ^1D°$ 40.03
6276.563	A	7*d*	14.04	16.01	1–2	$3p'\ ^1P-5s'\ ^1D°$ 40.04

O I—Continued

I A	Ref.	Int.	E P Low	E P High	J	Multiplet No.
Air						
6066.986	A	7*d*	14.04	16.08	1-0	$3p'\ ^1P - 4d'\ ^1S°$ 40.05
*9995.310	A	14	14.05	15.29	3-2	$3p'\ ^3D - 3d'\ ^3P°$ 40.06
9936.983	A	13	14.05	15.29	2-1	
9909.050	A	12	14.05	15.30	1-0	
*9995.310	A	14	14.05	15.29	2-2	
9940.408	A	12	14.05	15.29	1-1	
9998.802	A	8	14.05	15.29	1-2	
9156.011	A	17	14.05	15.40	3-4	$3p'\ ^3D - 3d'\ ^3F°$ 41
*9151.481	A	10	14.05	15.40	2-3	
9150.135	A	10	14.05	15.40	1-2	
*9151.481	A	10	14.05	15.40	3-3	
*9147.230	A	9	14.05	15.40	2-2	
*9147.230	A	9	14.05	15.40	3-2	
9135.055	A	9	14.05	15.40	3-4	$3p'\ ^3D - 3d'\ ^3G°$ 41.01
9134.711	A	10	14.05	15.40	1-0	$3p'\ ^3D - 3d'\ ^1S°$ 41.02
9118.288	A	12	14.05	15.41	3-4	$3p'\ ^3D - 3d'\ ^1G°$ 41.03
9071.209	A	8	14.05	15.41	1-2	$3p'\ ^3D - 3d'\ ^1D°$ 41.04
9062.098	A	7	14.05	15.41	-3	$3p'\ ^3D - 3d'\ ^1F°$ 41.05
*7706.751	A	11	14.05	15.65	3-2	$3p'\ ^3D - 2p^5\ ^3P°$ 42
7663.443	A	9	14.05	15.66	2-1	
7639.984	A	7	14.05	15.67	1-0	
*7706.751	A	11	14.05	15.65	2-2	
7665.483	A	7	14.05	15.66	1-1	
7708.825	A	3	14.05	15.65	1-2	
6106.266	A	11	14.05	16.08	3-4	$3p'\ ^3D - 4d'\ ^3F°$ 43
6101.750	A	3	14.05	16.08	1-0	$3p'\ ^3D - 4d'\ ^1S°$ 43.01
6094.126	A	6	14.05	16.08	3-4	$3p'\ ^3D - 4d'\ ^1G°$ 43.02
*5995.277	A	10	14.05	16.11	3-2	$3p'\ ^3D - 4d'\ ^3P°$ 44
5991.915	A	7	14.05	16.11	2-1	
5991.305	A	7	14.05	16.12	1-0	
*5995.277	A	10	14.05	16.11	2-2	
5993.163	A	6	14.05	16.11	1-1	
5290.693	A	6	14.05	16.39	3-4	$3p'\ ^3D - 5d'\ ^3F°$ 44.01

O I—Continued

I A	Ref.	Int.	E P Low	E P High	J	Multiplet No.
Air						
9521.956	A	16	14.10	15.40	4-4	$3p'\ ^3F - 3d'\ ^3F°$ 45
9523.364	A	12	14.10	15.40	3-3	
9523.965	A	12	14.10	15.40	2-2	
9528.282	A	11	14.10	15.40	3-4	
9497.974	A	18	14.10	15.40	4-5	$3p'\ ^3F - 3d'\ ^3G°$ 47
9505.594	A	17	14.10	15.40	3-4	
9497.895	P	m O I	14.10	15.41	2-3	
9499.300	A	14	14.10	15.40	4-4	
9492.708	A	13	14.10	15.41	3-3	
9481.165	A	12	14.10	15.41	4-4	$3p'\ ^3F - 3d'\ ^1G°$ 47.01
9487.434	A	17	14.10	15.41	3-4	
9431.715	A	8	14.10	15.41	2-3	$3p'\ ^3F - 3d'\ ^1F°$ 47.02
6266.890	A	9	14.10	16.08	4-4	$3p'\ ^3F - 4d'\ ^3F°$ 48
6261.547	A	11	14.10	16.08	4-5	$3p'\ ^3F - 4d'\ ^3G°$ 50
6264.549	A	9	14.10	16.08	3-4	
6261.451	P	m O I	14.10	16.08	2-3	
6261.814	A	6	14.10	16.08	4-4	
6259.196	A	6	14.10	16.08	3-3	
6254.102	A	4	14.10	16.08	4-4	$3p'\ ^3F - 4d'\ ^1G°$ 50.01
6256.832	A	10	14.10	16.08	3-4	
5410.856	A	4	14.10	16.39	4-4	$3p'\ ^3F - 5d'\ ^3F°$ 51
5408.595	A	6	14.10	16.39	4-5	$3p'\ ^3F - 5d'\ ^3G°$ 53
5410.739	A	4	14.10	16.39	3-4	
5404.993	A	5	14.10	16.39	3-4	$3p'\ ^3F - 5d'\ ^1G°$ 53.01
8426.164	A	12	14.12	15.59	2-3	$3s''\ ^3P°- 4p'\ ^3D$ 54
8428.319	A	8	14.12	15.59	1-2	
8429.050	A	8	14.12	15.60	0-1	
8420.918	A	6	14.12	15.59	2-2	
8424.687	P	m Ar I	14.12	15.60	1-1	
7476.440	A	16	14.12	15.78	2-3	$3s''\ ^3P°- 3p''\ ^3D$ 55
7479.075	A	12	14.12	15.78	1-2	
7480.670	A	12	14.12	15.78	0-1	
7473.241	A	9	14.12	15.78	2-2	
7477.236	A	11	14.12	15.78	1-1	
7471.104	A	6	14.12	15.78	2-1	
11358.692	A	18	14.13	15.22	3-2	$3p'\ ^1F - 4s'\ ^1D°$ 55.01

O I—Continued

I A	Ref.	Int.	E P		J	Multiplet No.
			Low	High		
Air						
*9784.55§	A		14.13	15.40	3–4	$3p'\ ^1F - 3d'\ ^3F°$ 55.02
9760.653	A	17	14.13	15.40	3–4	$3p'\ ^1F - 3d'\ ^3G°$ 55.03
9741.503	A	17	14.13	15.41	3–4	$3p'\ ^1F - 3d'\ ^1G°$ 55.04
9684.513	A	8	14.13	15.41	3–2	$3p'\ ^1F - 3d'\ ^1D°$ 55.05
9677.384	A	14	14.13	15.41	3–3	$3p'\ ^1F - 3d'\ ^1F°$ 58
6604.906	A	10	14.13	16.01	3–2	$3p'\ ^1F - 5s'\ ^1D°$ 58.01
6374.324	A	11	14.13	16.08	3–4	$3p'\ ^1F - 4d'\ ^3G°$ 59
6366.335	A	11	14.13	16.08	3–4	$3p'\ ^1F - 4d'\ ^1G°$ 59.01
6351.156	A	8	14.13	16.08	3–3	$3p'\ ^1F - 4d'\ ^1F°$ 61
5492.432	A	5	14.13	16.39	3–4	$3p'\ ^1F - 5d'\ ^3G°$ 61.01
5486.517	A	5	14.13	16.39	3–4	$3p'\ ^1F - 5d'\ ^1G°$ 61.02

O I—Continued

I A	Ref.	Int.	E P		J	Multiplet No.
			Low	High		
Air						
8508.583	A	7	14.37	15.83	1–1	$3s''\ ^1P°- 3p''\ ^1P$ 61.03
7886.273	A	10	14.37	15.94	1–2	$3s''\ ^1P°- 3p''\ ^1D$ 64
6653.834	A	11	14.37	16.23	1–0	$3s''\ ^1P°- 3p''\ ^1S$ 65
16212.06	A	14	14.46	15.22	2–2	$3p'\ ^1D - 4s'\ ^1D°$ 66
12990.77	A	12	14.46	15.41	2–3	$3p'\ ^1D - 3d'\ ^1F°$ 67
7997.013	A	8	14.46	16.01	2–2	$3p'\ ^1D - 5s'\ ^1D°$ 68
17966.70	A	12	15.40	16.09	4–5	$3d'\ ^3F°- 4f'\ ^3G$ 69
18046.23	A	12	15.40	16.09	5–6	$3d'\ ^3G°- 4f'\ ^3H$
18041.48	A	12	15.40	16.09	4–5	70
18042.19	A	12	15.41	16.09	4–5	$3d'\ ^1G°- 4f'\ ^1H$ 71

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