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RADIATIVE TRANSITION PROBABILITIES FOR O I-O VII IONS

By V.A. Abramov, T.I. Zhukova, A.G. Zhidkov and A.S. Kukushkin
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Translated by the IAEA

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In dealing with a number of problems associated with the interpretation of experimental data obtained from modern fusion facilities and in designing tokamak reactors it is necessary to have a fairly full set of data on the various atomic characteristics of multicharged ions which are present in the plasma (energy levels, oscillator strengths, excitation cross-sections for various particles etc.). It should be noted that at present higher accuracies are required in respect of such data since the existing accuracy (especially for complex ions) is not good enough for certain problems (for example, for calculation of radiative losses in tokamak reactors without diverters). Largely for these reasons, in recent years considerable effort has gone into the experimental determination and calculation of the various atomic characteristics. The results of these studies are to be found in a variety of publications, and it is therefore important to collect together the information of interest to us and to present it in a form convenient for use. Work of this kind has been going on for many years at the National Bureau of Standards (USA) and the Oak Ridge National Laboratory.

In the present publication we have collected together the data on radiative transitions for oxygen ions since oxygen is present mostly as an impurity in the plasma. Similar work for carbon atoms was reported earlier in Ref. [1].

The material is presented in the following manner. All data are given for ions with different states of ionization (O I–O VII). As far as possible we have given the full set of available data on each transition. The notations $\lambda(E)$ and $\lambda(T)$ stand for experimental and theoretical values of wavelengths. If some parameters have zero values for a transition in the tables, this means that no information is available on them (except of course the transition with change in the total moment (0–0)). The values of E_k (eV) given in the tables refer to the energy of the upper level of the transition considered. It is to be recalled that the radiative transition probability A_{ki} and the oscillator strength during absorption f_{ik} (which is used to calculate the ion excitation cross-sections for various particles) are connected by the relationship

$$A_{ki} = 8 \cdot 10^9 \frac{g_i}{g_k} \left(\frac{\Delta E}{Ry} \right)^2 f_{ik},$$

where g_i, g_k are the statistical weights of levels i and k, respectively, ΔE is the difference in the energies of levels i and k, in eV, and Ry = 13.6 eV. In the column (J-J) of the tables the asterisks denote radiative transition probabilities averaged over moments

$$A(2 \to 1) = \frac{1}{\sum_{j_2} (2j_2 + 1)} \sum A_{j_2 j_1} ,$$

where j_2 and j_1 refer to the initial and final states, respectively.

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ION	OXYGEN O I				
λ(Å)	Transition	E_k (eV)	A_{ki} (s^{-1})	f_{ik}	J-J
11302.20	$3p\ ^5P - 4s\ ^5S^o$	11.840	1.27+07	1.75-01	3.0-2.0
11299.00	$3p\ ^5P - 4s\ ^5S^o$	11.840	2.72+07	1.13-01	7.0-7.0
11297.60	$3p\ ^5P - 4s\ ^5S^o$	11.840	9.10+06	1.13-01	2.0-2.0
11295.00	$3p\ ^5P - 4s\ ^5S^o$	11.840	6.40+06	1.79-01	1.0-2.0
11287.00	$3p\ ^5P - 3d\ ^5D^o$	12.090	2.55+07	7.50-01	4.0-7.0
9391.20	$3s'\ ^4D^o - 3p'\ ^4P$	14.050	2.16+07	1.41-01	2.0-1.0
9269.99	$3p\ ^5P - 3d\ ^5D^o$	12.080	4.19+07	6.90-01	3.0-4.0
9265.99	$3p\ ^5P - 3d\ ^5D^o$	12.080	1.40+07	1.20-01	3.0-3.0
9265.99	$3p\ ^5P - 3d\ ^5D^o$	12.080	2.79+06	2.57-02	3.0-2.0
9262.73	$3p\ ^5P - 3d\ ^5D^o$	12.080	2.45+07	3.15-01	2.0-2.0
9262.73	$3p\ ^5P - 3d\ ^5D^o$	12.080	2.80+07	9.80-01	2.0-3.0
9263.90	$3p\ ^5P - 3d\ ^5D^o$	12.080	4.19+07	9.07-01	1.0-2.0
9262.73	$3p\ ^5P - 3d\ ^5D^o$	12.080	1.05+07	8.10-02	2.0-1.0
9260.84	$3p\ ^5P - 3d\ ^5D^o$	12.080	1.47+07	3.16-01	1.0-2.0
9260.84	$3p\ ^5P - 3d\ ^5D^o$	12.080	3.15+07	4.05-01	1.0-1.0
9260.84	$3p\ ^5P - 3d\ ^5D^o$	12.080	4.20+07	1.80-02	1.0-0.0
8820.45	$3s'\ ^4D^o - 3p'\ ^4F$	14.150	2.61+07	4.26-01	2.0-3.0
8508.63	$3s''\ ^4P^o - 3p''\ ^4P$	16.830	2.89+07	3.14-01	1.0-1.0
8446.60	$3s\ ^5S^o - 3p\ ^5P$	10.990	3.80+07	6.98-01	1.0-4.0
8235.31	$3s'\ ^4D^o - 3p'\ ^4D$	14.050	4.32+06	7.32-02	1.0-2.0
8232.99	$3s'\ ^4D^o - 3p'\ ^4D$	14.050	2.61+07	2.66-01	1.0-1.0
8230.01	$3s'\ ^4D^o - 3p'\ ^4D$	14.050	2.61+06	5.71-02	2.0-3.0
8230.01	$3s'\ ^4D^o - 3p'\ ^4D$	14.050	2.11+07	2.14-01	2.0-2.0
8227.64	$3s'\ ^4D^o - 3p'\ ^4D$	14.050	8.34+06	5.08-02	2.0-1.0
8226.80	$3s'\ ^4D^o - 3p'\ ^4D$	14.050	3.29+07	3.27-01	4.0-3.0
8221.84	$3s'\ ^4D^o - 3p'\ ^4D$	14.050	6.63+06	4.80-02	3.0-2.0
8221.84	$3s'\ ^4D^o - 3p'\ ^4D$	14.050	2.92+07	2.96-01	3.0-3.0
8073.70	$3s'\ ^4P^o - 3p'\ ^4S$	10.660	5.39+07	1.10-01	4.0-4.0
7996.12	$3p\ ^3P - 3s'\ ^3D^o$	12.540	2.90+07	3.80-01	2.0-3.0
7989.90	$3p\ ^3P - 3s'\ ^3D^o$	12.540	2.10+07	3.40-01	1.0-2.0
7987.34	$3p\ ^3P - 3s'\ ^3D^o$	12.540	7.20+06	6.80-02	2.0-2.0
7987.00	$3p\ ^3P - 3s'\ ^3D^o$	12.540	2.10+07	3.40-01	1.0-2.0
7982.41	$3p\ ^3P - 3s'\ ^3D^o$	12.540	1.40+07	4.60-01	0.0-1.0
7982.30	$3p\ ^3P - 3s'\ ^3D^o$	12.540	8.00+06	4.60-02	2.0-1.0
7981.97	$3p\ ^3P - 3s'\ ^3D^o$	12.540	1.20+07	1.10-01	1.0-1.0
7952.18	$3s'\ ^4D^o - 3p'\ ^4F$	14.100	9.13+07	4.98-01	1.0-2.0
7950.83	$3s'\ ^4D^o - 3p'\ ^4F$	14.108	5.31+07	4.39-01	2.0-3.0
7949.30	$3s'\ ^4D^o - 3p'\ ^4F$	14.100	5.73+07	4.55-01	7.0-8.0
7947.56	$3s'\ ^4D^o - 3p'\ ^4F$	14.100	5.73+07	4.54-01	5.0-6.0
7947.20	$3s'\ ^4D^o - 3p'\ ^4F$	14.100	5.80+06	6.50-02	2.0-2.0
7943.15	$3s'\ ^4D^o - 3p'\ ^4F$	14.100	4.17+06	5.94-02	3.0-3.0
7939.49	$3s'\ ^4D^o - 3p'\ ^4F$	14.100	1.60+05	1.10-03	1.0-2.0
7886.51	$3s''\ ^4P^o - 3p''\ ^4D$	15.940	5.70+07	9.75-01	1.0-2.0
7775.40	$3s\ ^5S^o - 3p\ ^5P$	10.740	3.40+07	1.84-01	2.0-1.0
7774.18	$3s\ ^5S^o - 3p\ ^5P$	10.740	3.40+07	3.07-01	2.0-2.0
7773.40	$3s\ ^5S^o - 3p\ ^5P$	10.740	3.40+07	9.22-01	2.0-3.0
7771.96	$3s\ ^5S^o - 3p\ ^5P$	10.740	3.40+07	4.31-01	2.0-1.0
7480.66	$3s''\ ^4P^o - 3p''\ ^4D$	15.730	2.26+07	5.70-01	0.0-1.0
7479.06	$3s''\ ^4P^o - 3p''\ ^4D$	15.730	5.06+07	4.28-01	1.0-2.0
7477.71	$3s''\ ^4P^o - 3p''\ ^4D$	15.730	1.70+07	1.43-01	1.0-1.0

ION	OXYGEN O I				
λ(Å)	Transition	E_k (eV)	A_{ki} (s^{-1})	f_{ik}	J-J
7477.30	$3s^{\circ}\ ^3P^{\circ}-3p^{\circ}\ ^3D$	15.780	4.08+07	5.70-01	4.0-7.0
7476.45	$3s^{\circ}\ ^3P^{\circ}-3p^{\circ}\ ^3D$	15.780	4.08+07	4.79-01	2.0-3.0
7473.23	$3s^{\circ}\ ^3P^{\circ}-3p^{\circ}\ ^3D$	15.780	1.02+07	8.56-02	2.0-2.0
7471.36	$3s^{\circ}\ ^3P^{\circ}-3p^{\circ}\ ^3D$	15.780	1.14+06	5.71-03	2.0-1.0
7254.40	$3p\ ^3P-5s\ ^3S^{\circ}$	12.700	6.20+06	1.62-02	4.0-4.0
7194.60	$3s'\ ^1P^{\circ}-3p^{\circ}\ ^1P$	15.840	4.78+07	3.71-01	4.0-4.0
7156.80	$3s'\ ^1D^{\circ}-3p'\ ^1D$	14.460	4.73+07	3.63-01	2.0-2.0
7002.10	$3p\ ^3P-4d\ ^3D^{\circ}$	12.760	3.25+06	3.98-02	4.0-7.0
6665.78	$3s^{\circ}\ ^4P^{\circ}-3p^{\circ}\ ^4S$	16.230	6.00+07	1.33-01	1.0-0.0
6456.01	$3p\ ^5P-5s\ ^5S^{\circ}$	12.660	3.31+06	1.48-02	3.0-2.0
6455.00	$3p\ ^5P-5s\ ^5S^{\circ}$	12.660	7.10+06	1.48-02	7.0-2.0
6454.48	$3p\ ^5P-5s\ ^5S^{\circ}$	12.660	2.37+06	1.48-02	2.0-2.0
6453.64	$3p\ ^5P-5s\ ^5S^{\circ}$	12.660	1.42+06	1.48-02	1.0-2.0
6269.40	$3p'\ ^3F-4d'\ ^3F^{\circ}$	16.060	1.98+06	1.17-02	10.0-10.0
6259.60	$3p'\ ^3F-4d'\ ^3G^{\circ}$	16.080	6.30+06	4.75-02	10.0-12.0
6242.50	$3s'\ ^3D^{\circ}-3p'\ ^3P$	14.520	7.30+07	2.57-01	7.0-4.0
6158.19	$3p\ ^5P-4d\ ^5D^{\circ}$	12.750	2.34+06	1.33-02	3.0-3.0
6158.19	$3p\ ^5P-4d\ ^5D^{\circ}$	12.750	7.01+06	5.12-02	3.0-4.0
6158.19	$3p\ ^5P-4d\ ^5D^{\circ}$	12.750	4.60+05	1.90-03	3.0-2.0
6157.30	$3p\ ^5P-4d\ ^5D^{\circ}$	12.750	7.01+06	6.64-02	7.0-10.0
6156.78	$3p\ ^5P-4d\ ^5D^{\circ}$	12.750	4.68+06	3.72-02	2.0-3.0
6156.78	$3p\ ^5P-4d\ ^5D^{\circ}$	12.750	1.75+06	5.98-03	2.0-1.0
6156.78	$3p\ ^5P-4d\ ^5D^{\circ}$	12.750	4.10+06	2.33-02	2.0-2.0
6155.99	$3p\ ^5P-4d\ ^5D^{\circ}$	12.750	7.02+06	1.33-02	1.0-0.0
6106.50	$3p'\ ^3D-4d'\ ^3F^{\circ}$	12.750	4.60+06	3.60-02	7.0-10.0
6046.40	$3p\ ^3P-6s\ ^3S^{\circ}$	13.040	2.34+06	4.27-03	4.0-1.0
5436.83	$3p\ ^5P-6s\ ^5S^{\circ}$	13.020	1.42+06	4.51-03	5.0-2.0
5436.10	$3p\ ^5P-6s\ ^5S^{\circ}$	13.020	3.05+06	4.50-03	7.0-2.0
5435.76	$3p\ ^3P-6s\ ^3S^{\circ}$	13.020	1.02+06	4.50-03	2.0-2.0
5435.16	$3p\ ^5P-6s\ ^5S^{\circ}$	13.020	6.10+05	4.51-03	1.0-2.0
5330.66	$3p\ ^5P-5d\ ^5D^{\circ}$	13.060	1.96+06	1.07-02	5.0-4.0
5330.66	$3p\ ^5P-5d\ ^5D^{\circ}$	13.060	6.60+05	2.10-03	5.0-3.0
5330.66	$3p\ ^3P-5d\ ^3D^{\circ}$	13.060	1.30+05	4.00-04	3.0-2.0
5330.08	$3p\ ^5P-5d\ ^5D^{\circ}$	13.060	1.97+06	1.40-02	7.0-10.0
5329.98	$3p\ ^5P-5d\ ^5D^{\circ}$	13.060	6.90+05	4.90-03	1.0-2.0
5329.98	$3p\ ^3P-5d\ ^3D^{\circ}$	13.060	1.48+06	6.50-03	1.0-1.0
5329.59	$3p\ ^5P-5d\ ^5D^{\circ}$	13.060	1.31+06	7.80-03	2.0-3.0
5329.59	$3p\ ^5P-5d\ ^5D^{\circ}$	13.060	1.16+06	4.80-03	2.0-2.0
5329.59	$3p\ ^5P-5d\ ^5D^{\circ}$	13.060	4.90+05	1.20-03	2.0-1.0
5328.98	$3p\ ^5P-5d\ ^5D^{\circ}$	13.060	1.97+06	2.70-03	1.0-0.0
3949.30	$3s\ ^3S^{\circ}-4p\ ^3P$	12.360	6.60+05	5.60-03	1.0-4.0
3947.29	$3s\ ^3S^{\circ}-4p\ ^3P$	12.360	3.20+05	2.20-03	2.0-1.0
1358.52	$2p^3\ ^3P-3s\ ^3S^{\circ}$	9.140	3.81+08	1.81+00	1.0-2.0
1355.61	$2p^3\ ^3P-3s\ ^3S^{\circ}$	9.140	1.51+08	3.61+00	2.0-2.0
1306.04	$2p^4\ ^3P-3s\ ^3S^{\circ}$	9.520	4.10+07	3.10-02	0.0-1.0
1304.87	$2p^4\ ^3P-3s\ ^3S^{\circ}$	9.520	1.30+08	3.20-02	1.0-1.0
1303.50	$2p^4\ ^3P-3s\ ^3S^{\circ}$	9.520	3.80+08	3.10-02	4.0-1.0
1302.17	$2p^4\ ^3P-3s\ ^3S^{\circ}$	9.520	2.10+08	3.10-02	2.0-1.0
1217.64	$2p^3\ ^4S-3s''\ ^4P^{\circ}$	14.370	2.00+08	1.30-01	0.0-1.0
1152.16	$2p^3\ ^2D-3s'\ ^2D^{\circ}$	12.730	4.60+08	3.00-02	2.0-2.0

ION	OXYGEN O I				
λ (Å)	Transition	E_k (eV)	A_{ki} (s^{-1})	f_{ik}	J-J
1028.16	$2p^4\ ^3P-3d\ ^3D^o$	12.090	2.00+07	1.00-02	0.0-1.0
1027.42	$2p^4\ ^3P-3d\ ^3D^o$	12.090	2.90+07	7.70-03	1.0-2.0
1027.42	$2p^4\ ^3P-3d\ ^3D^o$	12.090	1.60+07	2.60-03	1.0-1.0
1025.77	$2p^4\ ^3P-3d\ ^3D^o$	12.090	5.90+07	8.60-03	2.0-3.0
1025.77	$2p^4\ ^3P-3d\ ^3D^o$	12.090	9.70+06	1.50-03	2.0-2.0
1025.77	$2p^4\ ^3P-3d\ ^3D^o$	12.090	1.10+06	1.10+02	2.0-1.0
999.49	$2p^4\ ^1D-3s''\ ^1P^o$	14.370	5.90+08	3.50-02	2.0-1.0
990.80	$2p^4\ ^3P-3s'\ ^3D^o$	12.540	1.20+08	5.40-02	0.0-1.0
990.13	$2p^4\ ^3P-3s'\ ^3D^o$	12.540	9.50+07	1.40-02	1.0-1.0
990.12	$2p^4\ ^3P-3s'\ ^3D^o$	12.540	1.70+08	4.20-02	1.0-2.0
989.46	$2p^4\ ^3P-3s'\ ^3D^o$	12.540	2.30+08	5.60-02	4.0-7.0
988.78	$2p^4\ ^3P-3s'\ ^3D^o$	12.540	2.30+08	4.70-02	2.0-3.0
988.66	$2p^4\ ^3P-3s'\ ^3D^o$	12.540	5.80+07	8.50-03	2.0-2.0
988.58	$2p^4\ ^3P-3s'\ ^3D^o$	12.540	6.60+06	5.80-13	2.0-1.0
936.01	$2p^4\ ^1D-3d'\ ^1F^o$	15.410	8.30+07	1.50-02	2.0-3.0
879.55	$2p^4\ ^3P-3s''\ ^3P^o$	14.120	1.91+10	3.80-02	0.0-1.0
879.11	$2p^4\ ^3P-3s''\ ^3P^o$	14.120	8.30+07	1.60-02	1.0-2.0
879.03	$2p^4\ ^3P-3s''\ ^3P^o$	14.120	7.90+07	9.10-03	1.0-1.0
878.38	$2p^4\ ^3P-3s''\ ^3P^o$	14.120	3.92+10	1.20-02	1.0-0.0
878.45	$2p^4\ ^3P-3s''\ ^3P^o$	14.120	3.91+10	3.70-02	4.0-4.0
877.88	$2p^4\ ^3P-3s''\ ^3P^o$	14.120	2.94+10	2.70-02	2.0-2.0
877.80	$2p^4\ ^3P-3s''\ ^3P^o$	14.120	1.93+10	9.20-03	2.0-1.0
811.37	$2p^4\ ^3P-3d'\ ^3P^o$	15.500	9.78+10	7.70-03	4.0-4.0

ION	OXYGEN O II				
λ (Å)	Transition	E_k (eV)	A_{ki} (s^{-1})	f_{ik}	J-J
6988.11	$3d\ ^4F - 4p\ ^4D^\circ$	30.470	3.32+07	1.19-01	1.5-0.5
6906.54	$3d\ ^4F - 4p\ ^4D^\circ$	30.490	2.72+07	1.46-01	3.5-2.5
6895.29	$3d\ ^4F - 4p\ ^4D^\circ$	30.500	2.98+07	1.70-01	4.5-3.5
6885.07	$3d\ ^4F - 4p\ ^4D^\circ$	30.480	6.70+06	4.76-02	1.5-1.5
6869.74	$3d\ ^4F - 4p\ ^4D^\circ$	30.490	5.90+06	4.15-02	2.5-2.5
6844.97	$3d\ ^4F - 4p\ ^4D^\circ$	30.500	5.47+06	2.44-02	1.5-0.5
6844.10	$3d\ ^4F - 4p\ ^4D^\circ$	30.490	3.20+05	3.40-03	1.5-2.5
6810.60	$3d\ ^4F - 4p\ ^4D^\circ$	30.510	1.80+05	1.60-03	2.5-3.5
6721.35	$3s\ ^2p - 3p\ ^2S^\circ$	25.280	1.89+07	6.40-02	1.5-0.5
6718.10	$3d\ ^2p - 4p\ ^2P^\circ$	30.800	6.80+06	4.61-02	0.5-0.5
6678.19	$3d\ ^2p - 4p\ ^2P^\circ$	30.710	1.73+06	2.32-02	0.5-1.5
6666.94	$3d\ ^2p - 4p\ ^2P^\circ$	30.800	3.49+06	1.16-02	1.5-0.5
6640.90	$3s\ ^2p - 3p\ ^2S^\circ$	25.280	9.80+06	6.50-02	0.5-0.5
6627.62	$3d\ ^2p - 4p\ ^2P^\circ$	30.810	8.90+06	5.90-02	1.5-1.5
5206.73	$3p\ ^2P^\circ - 3d\ ^2D$	28.910	3.91+07	1.60-01	1.5-1.5
5199.56	$3p\ ^2P^\circ - 3d\ ^2D$	28.940	1.37+07	1.11-01	0.5-1.5
5176.00	$3p\ ^2P - 3d\ ^2P$	28.950	1.71+07	3.43-02	1.5-0.5
5160.02	$3p\ ^2P^\circ - 3d\ ^2P$	28.950	3.50+07	1.40-01	0.5-0.5
4965.78	$3p\ ^2P^\circ - 3d\ ^2D$	29.060	2.56+07	9.40-02	1.5-1.5
4943.06	$3p\ ^2P^\circ - 3d\ ^2D$	29.070	1.06+08	5.80-01	1.5-2.5
4941.12	$3p\ ^2P^\circ - 3d\ ^2D$	29.060	8.30+07	6.10-01	0.5-1.5
4924.60	$3p\ ^4S^\circ - 3d\ ^4P$	28.820	6.70+07	3.65-01	1.5-2.5
4906.88	$3p\ ^4S^\circ - 3d\ ^4P$	28.830	6.80+07	2.45-01	1.5-1.5
4890.93	$3p\ ^4S^\circ - 3d\ ^4P$	28.840	6.80+07	1.22-01	1.5-1.5
4872.20	$3p'\ ^2P - 3d'\ ^2D$	31.380	7.30+06	2.59-02	1.5-1.5
4871.58	$3p'\ ^2P^\circ - 3d'\ ^2D$	31.370	4.35+07	2.32-01	1.5-2.5
4864.95	$3p\ ^4S - 3d\ ^4D$	28.850	2.35+07	4.17-01	1.5-0.5
4861.03	$3p'\ ^2P^\circ - 3d'\ ^2D$	31.370	3.66+07	2.59-01	0.5-1.5
4856.76	$3p\ ^4S^\circ - 3d\ ^4D$	28.850	1.76+07	6.20-02	1.5-1.5
4856.49	$3p\ ^4S^\circ - 3d\ ^4D$	28.850	9.40+06	5.00-02	1.5-2.5
4845.01	$3p\ ^4S^\circ - 3d\ ^2F$	28.860	9.40+05	5.00-03	1.5-2.5
4845.00	$3p\ ^4S^\circ - 3d\ ^2F$	28.870	9.40+05	5.00-03	1.5-2.5
4752.70	$3p\ ^2D^\circ - 3d\ ^4D$	28.350	8.80+05	3.00-03	2.5-2.5
4751.34	$3p\ ^2D^\circ - 3d\ ^4D$	28.860	5.90+06	2.64-02	2.5-3.5
4741.71	$3p\ ^2D^\circ - 3d\ ^2F$	28.860	9.00+06	3.02-02	2.5-2.5
4710.04	$3p\ ^2D^\circ - 3d\ ^4D$	28.850	1.70+07	8.50-02	2.5-3.5
4705.36	$3p\ ^2D^\circ - 3d\ ^2F$	28.880	1.38+08	6.10-01	2.5-3.5
4703.18	$3p'\ ^2D^\circ - 3d'\ ^2F$	31.150	8.20+07	4.10-01	1.5-2.5
4701.76	$3p'\ ^2P^\circ - 3d'\ ^2P$	31.460	3.49+07	5.80-02	1.5-0.5
4701.23	$3p'\ ^2P^\circ - 3d'\ ^2P$	31.460	8.70+07	2.89-01	1.5-1.5
4689.21	$3p'\ ^2D^\circ - 3d'\ ^2F$	31.150	8.80+07	5.90-01	2.5-3.5
4698.48	$3p'\ ^2D^\circ - 3d'\ ^2F$	31.150	5.90+06	1.95-02	2.5-2.5
4696.36	$3s\ ^4P - 3p\ ^4D$	25.640	3.72+06	8.20-03	2.5-1.5
4691.47	$3p'\ ^2P^\circ - 3d'\ ^2P$	31.460	7.00+07	2.32-01	0.5-0.5
4690.97	$3p'\ ^2P^\circ - 3d'\ ^2P$	31.460	1.76+07	1.16-01	0.5-1.5
4676.23	$3s\ ^4P - 3p\ ^4D^\circ$	25.650	2.57+07	8.40-02	2.5-2.5
4673.75	$3s\ ^4P - 3p\ ^4D^\circ$	25.630	1.31+07	2.14-02	1.5-0.5
4661.64	$3s\ ^4P - 3p\ ^4D^\circ$	25.640	5.20+07	1.69-01	1.5-1.5
4650.84	$3s\ ^4P - 3p\ ^4D^\circ$	25.630	8.20+07	2.65-01	0.5-0.5
4649.14	$3s\ ^4P - 3p\ ^4D^\circ$	25.660	1.04+08	4.48-01	2.5-3.5

ION	OXYGEN O II				
λ (Å)	Transition	E_k (eV)	A_{ki} (s^{-1})	f_{ik}	J-J
4641.81	$3s\,^4P-3p\,^4D^o$	25.650	7.90+07	3.81-01	1.5-2.5
4638.85	$3s\,^4P-3p\,^4D^o$	25.640	4.22+07	2.72-01	0.5-1.5
4613.11	$3d\,^2D-4f\,^4F^o$	31.750	1.21+07	8.86-02	2.5-2.5
4609.42	$3d\,^2D-4f\,^2F^o$	31.760	1.82+08	7.70-01	2.5-3.5
4602.11	$3d\,^2D-4f\,^2F^o$	31.750	1.70+08	8.10-01	1.5-2.5
4598.20	$3p\,^2D^o-3d\,^2P$	28.940	3.72+06	7.90-03	2.5-1.5
4596.17	$3s'\,^2D-3p'\,^2F^o$	28.360	1.03+08	4.87-01	1.5-2.5
4586.00	$3s'\,^2D-3p'\,^2F^o$	28.360	7.90+06	2.51-02	2.5-2.5
4590.97	$3s\,^2D-3p'\,^2F^o$	28.360	1.11+08	4.66-01	2.5-3.5
4563.20	$3p\,^2D^o-3d\,^2P$	28.940	4.23+06	1.30-03	1.5-1.5
4539.60	$3p\,^2D^o-3d\,^2P$	28.960	4.30+06	6.60-03	1.5-0.5
4491.25	$3d\,^2P-4f\,^2D^o$	31.700	1.84+08	8.20-01	1.5-2.5
4489.48	$3d\,^2P-4f\,^2D^o$	31.710	1.51+08	9.10-01	0.5-1.5
4469.32	$3s'''\,^6S^o-3p'''\,^6D$	31.600	9.20+07	1.84-01	1.5-2.5
4467.88	$3s'''\,^6S^o-3p'''\,^6P$	33.200	9.20+07	2.75-01	2.5-2.5
4464.60	$3d\,^2P-4f\,^2D^o$	31.720	3.07+07	9.20-02	1.5-1.5
4465.40	$3s'''\,^6S-3p'''\,^6P$	33.200	9.20+07	3.67-01	2.5-3.5
4452.38	$3s\,^2P-3p\,^2D$	26.220	1.54+07	4.57-02	1.5-1.5
4448.21	$3p'\,^2F-3d'\,^2F$	31.150	5.70+07	1.69-01	3.5-3.5
4447.70	$3p'\,^2F^o-3d'\,^2F$	31.150	2.82+06	6.50-03	3.5-2.5
4443.70	$3p'\,^2F^o-3d'\,^2F$	31.150	2.12+06	8.40-03	2.5-3.5
4443.05	$3p'\,^2F^o-3d'\,^2F$	31.150	5.70+07	1.67-01	2.5-2.5
4416.98	$3s\,^2P-3p\,^2D^o$	26.220	9.50+07	5.60-01	0.5-1.5
4414.91	$3s\,^2P-3p\,^2D^o$	26.250	1.15+08	5.00-01	1.5-2.5
4406.02	$3p\,^2D^o-3d\,^2D$	29.060	4.24+06	8.20-03	2.5-3.5
4395.95	$3p\,^2D^o-3d\,^2D$	29.070	3.98+07	1.15-01	2.5-2.5
4371.80	$3d\,^2F-4f\,^2G$	31.720	8.10+06	2.32-02	3.5-3.5
4369.28	$3p\,^2D^o-3d\,^2D$	29.060	3.91+07	1.12-01	1.5-1.5
4366.90	$3s\,^4P-3p\,^4P$	25.840	5.00+07	9.60-02	2.5-1.5
4359.38	$3p\,^2D^o-3d\,^2D$	29.070	2.93+06	1.25-02	1.5-2.5
4351.50	$3s'\,^2D-3p'\,^2D^o$	28.510	7.50+06	3.18-02	1.5-2.5
4351.27	$3s'\,^2D-3p'\,^2D^o$	28.510	9.70+07	2.75-01	2.5-2.5
4349.43	$3s\,^4P-3p\,^4P^o$	25.850	7.40+07	2.11-01	2.5-2.5
4349.10	$3s'\,^2D-3p'\,^2D^o$	28.510	4.02+07	1.92-02	2.5-1.5
4347.43	$3s'\,^2D-3p'\,^2D^o$	28.510	9.40+07	2.67-01	1.5-1.5
4345.56	$3s\,^4P-3p\,^4P^o$	25.830	8.90+07	1.25-01	1.5-0.5
4342.00	$3d\,^2F-4f\,^2G^o$	31.740	2.31+08	8.20-01	3.5-4.5
4340.36	$3d\,^2F-4f\,^2G^o$	31.720	2.23+08	8.40-01	2.5-3.5
4336.87	$3s\,^4P-3p\,^4P^o$	25.840	1.64+07	4.62-02	1.5-1.5
4329.00	$3s\,^2P-3p\,^4S$	26.310	1.50+05	4.40-04	1.5-1.5
4328.62	$3p'\,^2P^o-3d'\,^2S$	31.690	1.21+08	1.70-01	1.5-0.5
4325.77	$3s\,^4P-3p\,^4P^o$	25.850	1.55+07	4.35-02	0.5-0.5
4319.93	$3p'\,^2P^o-3d'\,^2S$	31.690	6.10+07	1.70-01	0.5-0.5
4319.63	$3s\,^4P-3p\,^4P^o$	25.850	2.84+07	1.19-01	1.5-2.5
4317.14	$3s\,^4P-3p\,^4P^o$	25.840	4.24+07	2.37-01	0.5-1.5
4303.82	$3d\,^4P-4f\,^4D$	31.700	1.97+08	7.30-01	2.5-3.5
4295.50	$3s\,^4P-3p\,^4S$	26.310	2.00+04	1.40-04	0.5-1.5
4294.82	$3d\,^4P-4f\,^4D$	31.710	1.39+08	5.70-01	1.5-2.5
4283.83	$3d\,^4P-4f\,^4D$	31.730	1.66+08	4.57-01	0.5-0.5
4283.80	$3d\,^4P-4f\,^4D$	31.730	8.30+07	4.57-01	0.5-1.5

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λ (Å)	Transition	E_k (eV)	A_{ki} (s^{-1})	f_{ik}	J-J
4284.40	3d ^4D-4f $^4F^o$	31.750	2.04+06	4.20-03	3.5-2.5
4284.00	3d ^4D-4f $^4F^o$	31.750	4.21+06	7.70-03	2.5-1.5
4283.15	3d ^4D-4f $^4F^o$	31.750	5.90+07	1.62-01	1.5-1.5
4283.13	3d ^4D-4f $^4F^o$	31.750	5.10+07	1.41-01	2.5-2.5
4282.96	3d ^4D-4f $^4F^o$	31.750	1.58+08	6.50-01	1.5-2.5
4282.82	3d ^4D-4f $^4D^o$	31.730	1.06+08	2.93-01	1.5-1.5
4281.40	3d ^4P-4f $^4D^o$	31.710	6.00+07	1.64-01	2.5-2.5
4277.90	3d ^4D-4f $^4F^o$	31.750	3.02+07	8.30-02	2.5-2.5
4277.40	3d ^4D-4f $^4F^o$	31.750	1.49+08	8.20-01	3.5-2.5
4276.71	3d ^4D-4f $^4F^o$	31.750	1.82+08	6.60-01	2.5-3.5
4276.71	3d ^4P-4f $^4D^o$	31.730	3.34+07	4.58-02	1.5-0.5
4275.52	3d ^4D-4f $^4F^o$	31.760	1.82+08	6.60-01	3.5-4.5
4272.30	3s'' ^2S-3p'' $^2P^o$	31.030	1.08+08	8.90-01	0.5-2.5
4263.20	3d ^4P-4f $^4D^o$	31.730	1.01+07	1.84-01	2.5-1.5
4253.90	3d' ^2G-4f' $^2H^o$	34.230	2.63+08	8.70-01	3.5-4.5
4189.79	3p' ^2F-3d' ^2G	31.320	2.51+08	8.30-01	3.5-4.5
4189.60	3p' $^2F^o$ - 3d' ^2G	31.320	9.00+06	2.36-02	3.5-3.5
4185.46	3p' $^2F^o$-3d' ^2G	31.320	2.43+08	8.50-01	2.5-3.5
4169.28	3p $^4P^o$ -3d ^4P	28.820	2.20+07	5.70-02	2.5-2.5
4156.54	3p $^4P^o$ -3d ^4P	28.830	1.57+07	2.70-02	2.5-1.5
4153.30	3p $^4P^o$ -3d ^4P	28.820	7.70+07	2.98-01	1.5-2.5
4146.09	3p''' ^4P-3d''' $^6D^o$	36.190	2.10+07	6.80-02	3.5-4.5
4145.90	3p''' ^4P-3d''' $^6D^o$	36.190	7.50+06	1.94-02	3.5-3.5
4145.60	3p''' ^4P-3d''' $^6D^o$	36.190	1.67+06	3.20-03	3.5-2.5
4143.77	3p''' ^4P-3d''' $^6D^o$	36.190	1.35+07	4.64-02	2.5-3.5
4143.52	3p''' ^4P-3d''' $^6D^o$	36.190	1.29+07	3.31-02	2.5-2.5
4143.40	3p''' ^4P-3d''' $^6D^o$	36.190	6.50+06	1.08-02	2.5-1.5
4142.24	3p''' ^4P-3d''' $^6D^o$	36.190	6.60+06	2.53-02	1.5-2.5
4142.08	3p''' ^4P-3d''' $^6D^o$	36.190	2.11+07	2.71-02	1.5-0.5
4141.96	3p''' ^4P-3d''' $^6D^o$	36.190	1.48+07	3.80-02	1.5-1.5
4140.74	3p $^4F^o$ -3d ^4P	28.830	2.36+06	6.10-03	1.5-1.5
4132.81	3p $^4P^o$ -3d ^4P	28.830	8.40+07	4.30-01	0.5-1.5
4129.34	3p $^4P^o$ -3d ^4P	28.840	1.50+07	1.91-02	1.5-0.5
4126.10	3d ^4F-4f $^4G^o$	31.710	7.70+05	1.50-03	4.5-3.5
4121.48	3p $^4P^o$ -3d ^4P	28.840	9.30+07	2.37-01	0.5-0.5
4120.55	3p $^4P^o$ -3d ^4D	28.860	7.40+06	1.25-02	2.5-1.5
4110.28	3p $^4P^o$ -3d ^4D	28.860	4.43+07	1.13-01	2.5-2.5
4119.22	3p $^4P^o$ -3d ^4D	28.860	1.48+08	5.06-01	2.5-3.5
4114.40	3d ^4F-4f $^4G^o$	31.720	2.12+07	5.40-02	4.5-4.5
4113.82	3p' $^2F^o$-3d' ^2D	31.370	1.26+07	2.39-02	3.5-2.5
4110.80	3p $^4P^o$-3d ^4D	28.850	2.48+07	3.14-02	1.5-0.5
4110.20	3p' $^2F^o$-3d' ^2D	31.370	1.52+07	2.23-02	2.5-1.5
4109.80	3p' $^2F^o$ - 3d' ^2D	31.380	6.30+05	1.50-03	2.5-2.5
4109.30	3d ^4F-4f $^4G^o$	31.710	1.28+06	2.40-03	3.5-2.5
4108.75	3d ^4F-4f $^4G^o$	31.710	3.49+07	8.80-02	3.5-3.5
4106.03	3p $^4D^o$ - 3d ^4F	28.680	1.87+06	3.50-03	3.5-2.5
4105.00	3p $^4P^o$ - 3d ^4D	31.720	8.00+07	2.02-01	1.5-1.5
4104.74	3p $^4P^o$ - 3d ^4D	28.860	1.04+08	3.96-01	1.5-2.5
4103.09	3p $^4P^o$ - 3d ^4D	28.850	1.25+08	3.15-01	0.5-0.5
4087.26	3p $^4P^o$ - 3d ^4D	28.860	6.30+07	3.15-01	0.5-1.5

ION	OXYGEN O II				
λ (Å)	Transition	E_k (eV)	A_{ki} (s^{-1})	f_{ik}	J-J
4097.26	$3p\ ^4P^o-3d\ ^4D$	31.720	2.37+08	7.50-01	3.5-4.5
4096.54	$3p\ ^4P^o-3d\ ^2F$	28.860	9.20+06	5.47-02	1.5-2.5
4096.18	$3d\ ^4F-4f\ ^4G^o$	31.740	3.58+07	9.00-02	2.5-2.5
4095.63	$3d\ ^4F-4f\ ^4G^o$	31.710	2.23+08	7.50-01	2.5-3.5
4094.18	$3p\ ^4D^o-3d\ ^4F$	28.680	3.90+06	6.50-03	2.5-1.5
4092.94	$3p\ ^4D^o-3d\ ^4F$	28.690	2.78+07	7.00-02	3.5-3.5
4089.30	$3d\ ^4F-4f\ ^4G^o$	28.700	2.62+08	7.90-01	4.5-5.5
4087.16	$3d\ ^4F-4f\ ^4G^o$	31.710	2.24+08	8.40-01	1.5-2.5
4085.12	$3p\ ^4D^o-3d\ ^4F$	28.680	4.78+07	1.20-01	2.5-2.5
4084.66	$3p\ ^4P^o-3d\ ^4F$	28.880	6.50+06	2.16-02	2.5-3.5
4078.86	$3p\ ^4P^o-3d\ ^4F$	28.680	5.50+07	1.38-01	1.5-1.5
4076.87	$3p\ ^4D^o-3d\ ^4F$	28.700	1.98+08	6.20-01	2.5-4.5
4072.16	$3p\ ^4D^o-3d\ ^4F$	28.690	1.70+08	5.60-01	2.5-3.5
4069.90	$3p\ ^4D^o-3d\ ^4F$	28.680	1.49+08	5.50-01	1.5-2.5
4069.64	$3p\ ^4D^o-3d\ ^4F$	28.680	1.39+08	6.90-01	0.5-1.5
4060.80	$3d'\ ^2F-4f'\ ^2G^o$	34.200	2.20+08	7.00-01	3.5-4.5
3985.46	$3p\ ^4P^o-3d\ ^2P$	28.940	8.40+05	4.00-03	0.5-1.5
3982.72	$3s\ ^2P-3p\ ^2P^o$	26.550	4.47+07	5.30-02	1.5-0.5
3973.26	$3s\ ^2P-3p\ ^2P^o$	26.560	1.27+08	3.00-01	1.5-1.5
3967.44	$3p\ ^4P^o-3d\ ^2P^o$	28.950	1.33+06	3.10-03	0.5-0.5
3954.37	$3s\ ^2P-3p\ ^2P^o$	26.550	9.50+07	2.22-01	0.5-0.5
3945.05	$3s\ ^2P-3p\ ^2P^o$	26.560	2.17+07	1.01-01	0.5-1.5
3919.29	$3s'\ ^2D-3p'\ ^2P^o$	28.820	1.40+08	1.61-01	1.5-0.5
3912.09	$3s'\ ^2D-3p'\ ^2P^o$	28.830	1.37+07	3.14-02	1.5-1.5
3911.96	$3s'\ ^2D-3p'\ ^2P^o$	28.830	1.27+08	1.94-01	2.5-1.5
3907.45	$3p\ ^4D^o-3d\ ^4P$	28.830	1.15+06	2.50-03	2.5-2.5
3896.30	$3p\ ^4D^o-3d\ ^4P$	28.850	3.97+06	6.00-03	2.5-1.5
3893.53	$3p\ ^4D^o-3d\ ^4P$	28.820	1.20+05	4.30-04	1.5-2.5
3883.15	$3p\ ^4D^o-3d\ ^4D$	28.850	1.09+07	1.86-02	3.5-2.5
3882.45	$3p\ ^4D^o-3d\ ^4P$	28.830	2.04+06	4.62-03	1.5-1.5
3882.20	$3p\ ^4D^o-3d\ ^4D$	28.860	4.93+07	1.11-01	3.5-3.5
3875.82	$3p\ ^4D^o-3d\ ^2F$	28.860	9.60+05	1.60-03	0.5-1.5
3874.10	$3p\ ^4D^o-3d\ ^4P$	28.830	3.20+05	1.40-03	0.5-1.5
3872.45	$3p\ ^4D^o-3d\ ^4P$	28.840	3.21+06	5.62-03	2.5-1.5
3864.68	$3p\ ^4D^o-3d\ ^4P$	28.850	2.04+07	3.04-02	2.5-1.5
3864.45	$3p\ ^4D^o-3d\ ^4D$	28.850	3.34+07	7.50-02	2.5-2.5
3864.15	$3p\ ^4D^o-3d\ ^4P$	28.840	5.23+06	7.20-03	0.5-0.5
3863.50	$3p\ ^4D^o-3d\ ^4D$	28.860	8.50+06	2.48-02	2.5-3.5
3857.18	$3p\ ^4D^o-3d\ ^2F$	28.860	4.48+06	1.00-02	2.5-2.5
3856.16	$3p\ ^4D^o-3d\ ^4D$	28.850	2.33+07	3.27-02	1.5-0.5
3851.47	$3p\ ^4D^o-3d\ ^2F$	28.820	2.23+06	5.00-03	3.5-3.5
3851.04	$3p\ ^4D^o-3d\ ^4D$	28.860	2.36+07	5.20-02	1.5-1.5
3850.81	$3p\ ^4D^o-3d\ ^4D$	28.860	1.37+07	4.58-02	1.5-2.5
3847.89	$3p\ ^4D^o-3d\ ^4D$	28.850	2.95+07	6.60-02	0.5-0.5
3843.58	$3p\ ^4D^o-3d\ ^2F$	28.860	2.22+06	7.40-03	1.5-2.5
3842.82	$3p\ ^4D^o-3d\ ^4D$	28.860	1.42+07	6.60-02	0.5-1.5
3833.10	$3p\ ^4D^o-3d\ ^2F$	28.880	8.50+05	2.70-03	2.5-3.5
3830.46	$3p\ ^2P^o-4s\ ^2P$	29.100	2.15+07	2.36-02	1.5-0.5
3811.68	$3p\ ^2P^o-4s\ ^2P$	29.806	4.32+07	9.50-02	0.5-0.5
3805.14	$3p\ ^2P^o-4s\ ^2P$	29.820	5.50+07	1.19-01	1.5-1.5

ION	OXYGEN O II				
λ (Å)	Transition	E_k (eV)	A_{ki} (s^{-1})	f_{ik}	J-J
3794.48	$3p\ ^2P^o - 4s\ ^4P$	29.820	1.10+07	4.76-02	0.5-1.5
3777.60	$3p\ ^4S^o - 4s\ ^4P$	29.580	2.52+07	2.69-02	1.5-0.5
3762.63	$3p\ ^4S^o - 4s\ ^4P$	29.600	2.69+07	5.70-02	1.5-1.5
3749.49	$3s\ ^4P - 3p\ ^4S^o$	26.300	9.00+07	1.27-01	2.5-1.5
3739.92	$3p\ ^4S^o - 4s\ ^4P$	29.620	2.67+07	8.40-02	1.5-2.5
3735.94	$3p'\ ^2P^o - 4s'\ ^2D$	32.150	4.16+07	1.30-01	1.5-2.5
3735.90	$3p'\ ^2P^o - 4s'\ ^4D$	32.150	6.90+06	1.45-02	1.5-1.5
3735.90	$3p'\ ^2P^o - 4s'\ ^2D$	26.900	1.77+08	1.23-01	0.5-1.5
3729.54	$3p'\ ^2P^o - 4s'\ ^2D$	32.150	3.49+07	1.45-01	0.5-1.5
3727.55	$3s\ ^4P - 3p\ ^4S^o$	26.300	5.90+07	1.22-01	1.5-1.5
3712.75	$3s\ ^4P - 3p\ ^4S^o$	26.300	2.80+07	1.16-01	0.5-1.5
3496.27	$3p\ ^2S^o - 3d\ ^4P$	28.830	1.11+06	4.00-03	0.5-1.5
3488.18	$3p\ ^2S^o - 3d\ ^4P$	28.840	8.40+05	1.50-03	0.5-0.5
3479.70	$3s\ ^4P - 3p\ ^2P^o$	26.560	1.80+05	1.20-04	2.5-1.5
3474.94	$3p\ ^2S^o - 3d\ ^4D$	28.850	8.50+05	1.50-03	0.5-0.5
3470.81	$3p\ ^2D^o - 4s\ ^2P$	29.820	1.12+08	1.35-01	2.5-1.5
3470.42	$3p\ ^2D - 4s\ ^2P$	29.790	1.24+08	1.12-01	1.5-0.5
3460.60	$3s\ ^4P - 3p\ ^2P^o$	26.560	1.50+05	2.70-04	1.5-1.5
3447.98	$3p\ ^2D^o - 4s\ ^2P$	29.820	1.27+07	2.21-02	1.5-1.5
3409.84	$3p'\ ^2D^o - 4s'\ ^2D$	32.150	1.20+07	1.26-01	1.5-1.5
3409.84	$3p'\ ^2D^o - 4s'\ ^2D$	32.150	5.40+06	1.40-02	1.5-2.5
3407.38	$3p'\ ^2D^o - 4s'\ ^2D$	32.150	8.00+06	9.50-03	2.5-1.5
3407.38	$3p'\ ^2D^o - 4s'\ ^2D$	32.150	7.50+07	1.31-01	2.5-2.5
3390.25	$3p\ ^2S^o - 3d\ ^2P$	28.940	1.86+08	6.40-01	0.5-1.5
3377.20	$3p\ ^2S^o - 3d\ ^2P$	28.950	1.88+08	3.21-01	0.5-0.5
3306.60	$3p\ ^4P^o - 4s\ ^4P$	29.580	7.00+07	5.70-02	1.5-0.5
3305.15	$3p\ ^4P^o - 4s\ ^4P$	29.580	3.79+07	4.14-02	2.5-1.5
3301.56	$3p\ ^4P^o - 4s\ ^4P$	29.590	1.41+07	2.30-02	0.6-0.6
3295.13	$3p\ ^4P^o - 4s\ ^4P$	29.580	1.13+07	1.84-02	1.5-1.6
3290.13	$3p\ ^4P^o - 4s\ ^4P$	29.600	3.56+07	1.15-01	0.6-1.5
3287.59	$3p\ ^4P^o - 4s\ ^4P$	29.620	6.00+07	9.70-02	2.5-2.5
3282.00	$3p\ ^2S^o - 3d\ ^2D$	29.060	1.68+06	5.40-03	0.5-1.5
3277.69	$3p\ ^4P^o - 4s\ ^4P$	29.620	2.59+07	6.50-02	1.5-2.5
3273.52	$3p'\ ^2F^o - 4s'\ ^2D$	32.150	1.14+08	1.37-01	3.5-2.5
3270.98	$3p'\ ^2F^o - 4s'\ ^2D$	31.150	1.20+08	1.28-01	2.5-1.5
3270.90	$3p'\ ^2F^o - 4s'\ ^2D$	32.150	5.70+06	9.10-03	2.5-2.5
3139.77	$3p\ ^4D^o - 4s\ ^4P$	29.620	7.60+07	5.60-02	1.5-0.5
3138.44	$3p\ ^4D^o - 4s\ ^4P$	29.600	9.60+07	9.50-02	2.5-1.5
3134.82	$3p\ ^4D^o - 4s\ ^4P$	29.620	1.23+08	1.36-01	3.5-2.5
3134.32	$3p\ ^4D^o - 4s\ ^4P$	29.580	7.70+07	1.13-01	0.5-0.5
3129.44	$3p\ ^4D^o - 4s\ ^4P$	29.600	4.93+07	7.20-02	1.5-1.5
3124.02	$3p\ ^4D^o - 4s\ ^4P$	29.600	7.70+06	2.26-02	0.5-1.5
3122.62	$3p\ ^4D^o - 4s\ ^4P$	29.620	2.78+07	4.07-02	2.5-2.5
3113.71	$3p\ ^4D^o - 4s\ ^4P$	29.620	3.12+06	6.80-03	1.5-2.5
3047.50	$3d\ ^2F - 5f\ ^2G^o$	32.950	5.00+06	4.10-03	3.5-3.5
3032.50	$3d\ ^2F - 5f\ ^2G^o$	32.950	8.20+07	1.51-01	2.5-3.5
3032.08	$3d\ ^2F - 5f\ ^2G^o$	32.970	8.50+07	1.47-01	3.5-4.5
3019.80	$3d\ ^4P - 5f\ ^4D^o$	32.950	3.11+07	8.50-02	0.5-1.5
3014.00	$3d\ ^4P - 5f\ ^4D^o$	32.950	5.20+07	1.06-01	1.5-2.5
3013.37	$3d\ ^4P - 5f\ ^4D^o$	32.950	7.40+07	1.35-01	2.5-3.5

ION		OXYGEN O II			
λ (Å)	Transition	E_k (eV)	A_{ki} (s^{-1})	f_{ik}	J-J
3013.00	$3d\ ^4D-5\{\ ^4F^\circ$	32.970	1.67+06	1.50-03	2.5-1.5
3012.83	$3d\ ^4D-5\{\ ^4F^\circ$	32.970	2.55+07	3.20-02	2.5-2.5
3010.50	$3d\ ^4D-5\{\ ^4F^\circ$	32.980	8.10+05	8.30-04	3.5-2.5
3010.00	$3d\ ^4D-6\{\ ^4F^\circ$	32.980	2.04+07	2.78-02	2.5-2.5
3009.83	$3d\ ^4D-5\{\ ^4F^\circ$	32.970	6.30+07	1.28-01	1.5-2.5
3009.81	$3d\ ^4D-5\{\ ^4F^\circ$	32.980	6.30+07	1.28-01	1.5-2.5
3009.70	$3d\ ^4D-5\{\ ^4F^\circ$	32.970	5.90+07	1.59-01	0.5-1.5
3008.83	$3d\ ^4P-5\{\ ^4D^\circ$	32.950	3.98+07	5.40-02	1.5-1.5
3008.28	$3d\ ^4D-5\{\ ^4F^\circ$	32.980	1.20+07	1.63-02	3.5-3.5
3007.74	$3d\ ^4D-5\{\ ^4F^\circ$	32.980	7.20+07	1.30-01	2.5-3.5
3007.40	$3d\ ^4P-5\{\ ^4D^\circ$	32.940	2.25+07	3.65-02	2.5-2.5
3007.08	$3d\ ^4D-5\{\ ^4F^\circ$	32.980	8.40+07	1.43-01	3.5-4.5
3006.01	$3d\ ^4P-5\{\ ^4D^\circ$	32.960	6.30+07	8.50-02	0.5-0.5
3002.20	$3d\ ^4P-6\{\ ^4D^\circ$	32.950	5.76+06	3.30-03	2.5-1.5
3000.10	$3d\ ^4P-6\{\ ^4D^\circ$	32.960	1.26+07	8.50-03	1.5-0.5
3006.00	$3d\ ^4P-5\{\ ^4D^\circ$	32.960	6.30+07	8.50-02	0.5-0.5
2747.46	$3p\ ^2S^\circ-4s\ ^2P$	29.800	3.60+07	4.10-02	0.5-0.5
2753.34	$3p\ ^2S^\circ-4s\ ^2P$	29.820	3.70+07	8.20-02	0.5-1.5
834.46	$2p^3\ ^4S^\circ-2p^1\ ^4P$	14.860	1.30+09	2.10-01	1.5-2.5
833.33	$2p^3\ ^4S^\circ-2p^1\ ^4P$	14.880	1.40+09	1.50-01	1.5-1.5
832.75	$2p^3\ ^4S^\circ-2p^1\ ^4P$	14.890	1.40+09	7.00-02	1.5-0.5
796.66	$2p^3\ ^2P^\circ-2p^1\ ^2D$	20.580	4.40+08	7.00-02	1.5-2.5
718.56	$2p^3\ ^2D^\circ-2p^1\ ^2D$	20.580	2.90+09	2.20-01	1.5-2.5
718.48	$2p^3\ ^2D^\circ-2p^1\ ^2D$	20.580	3.10+08	1.60-02	2.5-2.5
673.77	$2p^3\ ^2P^\circ-3s\ ^2P$	23.420	6.20+08	4.20-02	1.5-0.5
672.95	$2p^3\ ^2P^\circ-3s\ ^2P$	23.440	7.70+08	5.20-02	1.5-0.5
644.15	$2p^3\ ^2P^\circ-2p^1\ ^2S$	24.260	7.20+09	1.50-01	1.5-0.5
617.05	$2p^3\ ^2D^\circ-3s\ ^2P$	23.420	1.80+09	5.10-02	1.5-0.5
616.36	$2p^3\ ^2D^\circ-3s\ ^2P$	23.440	1.80+08	1.00-02	0.5-0.5
616.29	$2p^3\ ^2D^\circ-3s\ ^2P$	23.440	1.60+09	6.10-02	2.5-1.5
600.58	$2p^3\ ^4P^\circ-3s'\ ^2D$	25.660	4.30+08	3.90-02	1.5-2.5
555.12	$2p^3\ ^2D^\circ-3s'\ ^2D$	25.660	9.70+07	6.70-03	1.5-2.5
555.12	$2p^3\ ^2D^\circ-3s'\ ^2D$	25.660	1.30+09	6.10-02	1.5-1.5
555.06	$2p^3\ ^2D^\circ-3s'\ ^2D$	25.660	1.50+08	4.50-03	2.5-1.5
555.06	$2p^3\ ^2D^\circ-3s'\ ^2D$	25.660	1.40+09	6.30-02	2.5-2.5
539.85	$2p^3\ ^4S^\circ-3s\ ^4P$	22.960	8.60+08	1.90-02	1.5-0.5
539.55	$2p^3\ ^4S^\circ-3s\ ^4P$	22.980	8.60+08	3.70-02	1.5-1.5
539.09	$2p^3\ ^4S^\circ-3s\ ^4P$	23.000	8.60+08	5.60-02	1.5-2.5
518.24	$2p^3\ ^2P^\circ-3d\ ^2P$	24.940	9.40+08	3.80-02	1.5-1.5
518.24	$2p^3\ ^2P^\circ-3d\ ^2P$	24.940	1.90+08	1.50-02	0.5-1.5
517.94	$2p^3\ ^2P^\circ-3d\ ^2P$	24.950	7.50+08	3.00-02	0.5-0.5
517.94	$2p^3\ ^2P^\circ-3d\ ^2P$	24.950	5.70+08	7.50-03	1.5-0.5
515.64	$2p^3\ ^2P^\circ-3d\ ^2D$	24.060	1.20+09	9.70-02	0.5-1.5
515.64	$2p^3\ ^2P^\circ-3d\ ^2D$	24.060	2.40+08	9.70-03	1.5-1.5
516.50	$2p^3\ ^2P^\circ-3d\ ^2D$	24.070	1.50+09	8.70-02	1.5-2.5
485.51	$2p^3\ ^2D^\circ-3d\ ^2F$	24.860	2.50+09	1.20-01	1.5-2.5
485.47	$2p^3\ ^2D^\circ-3d\ ^2F$	24.860	1.60+08	5.80-03	2.5-2.5
485.09	$2p^3\ ^2D^\circ-3d\ ^2F$	24.880	2.50+09	1.20-01	2.5-3.5
484.03	$2p^3\ ^2D^\circ-3d\ ^2P$	24.940	8.40+06	3.00-04	1.5-1.5
483.80	$2p^3\ ^2D^\circ-3d\ ^2P$	24.940	7.60+07	1.80-03	2.5-1.5

ION	OXYGEN O II				
λ (Å)	Transition	E_k (eV)	A_{ki} (s^{-1})	f_{ik}	J-J
483.75	$2p^3\ ^2D^o - 3d\ ^2P$	28.950	8.40+07	1.50-03	1.5-0.5
481.66	$2p^3\ ^2D^o - 3d\ ^2D$	29.060	5.40+08	1.90-02	4.5-4.5
470.41	$2p^3\ ^4P^o - 3d'\ ^4D$	31.370	6.50+08	3.60-02	1.5-2.5
468.77	$2p^3\ ^2P^o - 3d'\ ^4P$	31.460	1.20+09	3.90-02	1.5-[illegible]
464.79	$2p^3\ ^4P^o - 3d'\ ^4S$	31.690	1.60+09	1.70-02	1.5-0.5
445.62	$2p^3\ ^2D^o - 3d''\ ^2F$	31.150	2.60+09	1.10-01	1.5-2.[illegible]
442.85	$2p^3\ ^2D^o - 3d'\ ^2D$	31.370	2.10+09	6.30-02	1.5-1.5
440.58	$2p^3\ ^2D^o - 3d'\ ^2P$	31.460	7.70+08	1.30-02	1.5-0.5
430.18	$2p^3\ ^4S^o - 3d\ ^4P$	28.820	3.90+09	1.60-01	1.5-2.5
430.04	$2p^3\ ^4S^o - 3d\ ^4P$	28.830	3.90+09	1.10-01	1.5-1.5
429.92	$2p^3\ ^4S^o - 3d\ ^4P$	28.840	3.90+09	5.40-02	1.5-0.5
424.66	$2p^3\ ^2P^o - 3d'''\ ^2D$	34.210	1.90+09	8.60-02	2.5-4.5

ION	OXYGEN O III				
$\lambda_{(\AA)}$	Transition	E_k (eV)	A_{ki} (s^{-1})	f_{ik}	J-J
5592.37	$3s\ ^1P^o - 3p\ ^1P$	56.070	5.28+07	1.54-01	1.0-1.0
5508.11	$3p\ ^1D - 3d\ ^1D^o$	40.260	1.12+07	5.10-02	2.0-2.0
5268.06	$3p\ ^1S - 3d\ ^1P^o$	41.260	3.11+07	3.89-01	0.0-1.0
5114.00	$3p\ ^5S^o - 3d\ ^5P$	72.020	1.93+12	2.98-01	0.0-1.0
4461.56	$3p\ ^5S^o - 3d\ ^5P$	49.360	4.86+07	2.03-01	2.0-3.0
4447.82	$3p\ ^5S^o - 3d\ ^5P$	49.410	4.92+07	1.46-01	2.0-2.0
4440.11	$3p\ ^5S^o - 3d\ ^5P$	49.410	4.95+07	8.80-02	2.0-1.0
4118.60	$3s\ ^1P - 3p\ ^1D^o$	46.440	2.54+06	3.80-03	2.0-1.0
4105.80	$3s\ ^1P - 3p\ ^1D^o$	46.450	2.52+07	5.80-02	2.0-2.0
4088.50	$3s\ ^3P - 3p\ ^3D^o$	46.440	3.89+07	9.80-02	1.0-1.0
4081.10	$3s\ ^3P - 3p\ ^3D^o$	46.470	9.40+07	3.29-01	2.0-3.0
4073.90	$3s\ ^3P - 3p\ ^3D^o$	46.450	7.10+07	2.94-01	1.0-2.0
4072.30	$3s\ ^3P - 3p\ ^3D^o$	46.440	5.20+07	3.92-01	0.0-1.0
3961.59	$3p\ ^3D - 3d\ ^3F^o$	41.140	1.28+08	4.22-01	2.0-3.0
3816.75	$3p\ ^3D - 3d\ ^1P^o$	41.260	4.02+06	5.30-03	2.0-1.0
3810.96	$3s\ ^3P^o - 3p\ ^3D$	36.450	2.84+06	3.71-03	2.0-1.0
3791.26	$3s\ ^1P^o - 3p\ ^1D$	36.450	2.60+07	5.60-02	2.0-2.0
3774.00	$3s\ ^3P^o - 3p\ ^3D$	36.450	4.40+07	9.40-02	1.0-1.0
3761.20	$3p\ ^3D^o - 3d\ ^3F$	46.770	7.20+05	1.00-03	3.0-2.0
3759.87	$3s\ ^1P^o - 3p\ ^3D$	36.460	1.07+08	5.17-01	2.0-3.0
3757.21	$3s\ ^1P^o - 3p\ ^3D$	36.450	5.90+07	3.78-01	0.0-1.0
3754.67	$3s\ ^1P - 3p\ ^3D$	36.450	8.00+07	2.83-01	1.0-2.0
3747.60	$3p\ ^3D^o - 3d\ ^3F$	49.760	1.74+07	3.66-02	3.0-3.0
3742.00	$3p\ ^3D^o - 3d\ ^3F$	45.770	2.44+07	5.10-02	2.0-2.0
3734.88	$3s\ ^5P - 3p\ ^5D$	45.330	7.10+06	1.06-02	3.0-2.0
3732.13	$3p\ ^3P - 3d\ ^3D^o$	40.570	3.01+06	3.78-03	2.0-1.0
3729.70	$3p\ ^3D^o - 3d\ ^3F$	49.760	1.33+08	4.61-01	1.0-2.0
3728.82	$3p\ ^3D^o - 3d\ ^3F$	49.790	1.58+08	4.24-01	3.0-4.0
3728.49	$3p\ ^3D^o - 3d\ ^3F$	49.770	1.41+08	4.11-01	2.0-3.0
3725.30	$3p\ ^3P - 3d\ ^3D^o$	40.570	2.73+07	5.70-02	2.0-2.0
3721.95	$3s\ ^5P - 3p\ ^5D^o$	41.990	2.70+07	3.36-02	2.0-1.0
3720.86	$3s\ ^5P - 3p\ ^5D^o$	45.340	3.61+07	7.50-02	3.0-3.0
3715.08	$3p\ ^3P - 3d\ ^3D^o$	40.580	1.10+08	3.19-01	2.0-3.0
3714.05	$3p\ ^3P - 3d\ ^3D^o$	40.570	4.59+07	9.50-02	1.0-1.0
3712.48	$3s\ ^5P - 3p\ ^5D^o$	45.330	1.10+08	6.38+05	2.0-2.0
3709.52	$3s\ ^5P - 3p\ ^5D^o$	45.310	1.09+08	7.58-02	1.0-0.0
3707.24	$3p\ ^3P - 3d\ ^3D^o$	40.570	8.30+07	2.84-01	1.0-2.0
3705.37	$3s\ ^5P - 3p\ ^5D^o$	45.360	1.10+08	2.90-01	3.0-4.0
3702.75	$3p\ ^3P - 3d\ ^3D^o$	40.570	6.20+07	3.80-03	0.0-1.0
3698.70	$3s\ ^5P - 3d\ ^5D^o$	45.330	7.30+07	2.10-01	2.0-3.0
3695.37	$3s\ ^5P - 3p\ ^5D^o$	45.330	1.31+07	4.78+00	1.0-2.0
3053.00	$3p\ ^5P^o - 3d\ ^5D$	50.310	7.70+07	4.60-01	0.0-1.0
3650.70	$3p\ ^3P^o - 3d\ ^3D$	50.310	5.80+07	1.15-01	1.0-1.0
3649.20	$3p\ ^3P^o - 3d\ ^3D$	50.310	3.84+06	4.60-03	2.0-1.0
3646.84	$3p\ ^3P^o - 3d\ ^3D$	50.310	1.04+08	3.45-01	1.0-2.0
3645.20	$3p\ ^3P^o - 3d\ ^3D$	50.310	3.47+07	6.90-03	2.0-2.0
3638.70	$3p\ ^3P^o - 3d\ ^3D$	50.320	1.40+08	5.88-01	2.0-3.0
3556.92	$3s\ ^1P - 3p\ ^1P^o$	46.910	1.08+08	2.05-01	2.0-2.0
3555.30	$3s\ ^3P - 3p\ ^3P^o$	46.920	6.00+07	2.07-01	2.0-1.0
3534.30	$3s\ ^3P - 3p\ ^3P^o$	46.920	3.66+07	1.14-01	1.0-2.0

ION	OXYGEN O III				
λ (Å)	Transition	E_k (eV)	A_{ki} (s^{-1})	f_{ik}	I-I
3532.80	$3s\ ^1P - 3p\ ^1P^o$	46.920	3.67+07	6.90-02	1.0-1.0
3530.70	$3s\ ^3P - 3p\ ^3P^o$	46.920	1.47+08	9.20-02	1.0-0.0
3520.70	$3s\ ^3P - 3p\ ^3P^o$	46.920	4.99+07	2.75-01	0.0-1.0
3475.20	$3p\ ^5D^o - 3d\ ^5F$	48.930	2.34+06	3.30-03	4.0-3.0
3466.20	$3p\ ^5D^o - 3d\ ^5F$	48.920	6.60+06	8.50-03	3.0-2.0
3466.15	$3p\ ^5D^o - 3d\ ^5F$	48.930	2.76+07	4.97-02	4.0-4.0
3459.98	$3p\ ^5D^o - 3d\ ^5F$	48.920	4.96+07	8.90-02	3.0-3.0
3460.52	$3p\ ^5D^o - 3d\ ^5F$	48.910	1.11+07	1.19-02	2.0-1.0
3455.12	$3p\ ^5D^o - 3d\ ^5F$	48.940	1.67+08	3.65-01	4.0-5.0
3454.90	$3p\ ^5D^o - 3d\ ^5F$	92.920	6.70+07	1.20-01	2.0-2.0
3451.33	$3p\ ^5D^o - 3d\ ^5F$	48.910	7.80+07	1.40-01	1.0-1.0
3450.94	$3p\ ^5D^o - 3d\ ^5F$	48.930	1.40+08	3.21-01	3.0-4.0
3448.05	$3p\ ^5D^o - 3d\ ^5F$	48.920	1.15+08	2.87-01	2.0-3.0
3447.22	$3p\ ^5D^o - 3d\ ^5F$	48.910	7.80+07	4.19-01	0.0-1.0
3446.73	$3p\ ^5D^o - 3d\ ^5F$	48.920	9.40+07	2.79-01	1.0-2.0
3444.10	$3p\ ^3P - 3d\ ^3P^o$	40.150	5.90+07	1.04-01	2.0-2.0
3430.60	$3p\ ^3P - 3d\ ^3P^o$	40.860	3.30+07	3.49-02	2.0-1.0
3428.67	$3p\ ^3P - 3d\ ^3P^o$	40.860	1.98+07	5.80-02	1.0-2.0
3415.29	$3p\ ^3P - 3d\ ^3P^o$	40.860	2.00+07	3.50-02	1.0-1.0
3408.13	$3p\ ^3P - 3d\ ^3P^o$	40.870	8.10+07	4.69-02	1.0-0.0
3405.74	$3p\ ^3P - 3d\ ^3P^o$	40.860	2.70+07	1.41-01	0.0-1.0
3395.50	$3p\ ^5P^o - 3d\ ^5D$	49.360	9.60+06	1.10-03	3.0-2.0
3394.26	$3p\ ^5P^o - 3d\ ^5D$	49.360	4.80+07	8.30-02	3.0-3.0
3384.95	$3p\ ^5P^o - 3d\ ^5D$	49.370	1.45+08	3.21-01	3.0-4.0
3383.85	$3p\ ^5P^o - 3d\ ^5D$	49.360	8.50+07	1.45-01	2.0-2.0
3388.50	$3p\ ^5P^o - 3d\ ^5D$	49.360	3.63+07	3.74-02	2.0-1.0
3382.69	$3p\ ^5P^o - 3d\ ^5D$	49.360	9.70+07	2.53-01	2.0-3.0
3377.30	$3p\ ^5P^o - 3d\ ^5D$	49.360	5.10+07	1.46-01	1.0-2.0
3376.82	$3p\ ^5P^o - 3d\ ^5D$	49.360	1.09+08	1.87-01	1.0-1.0
3376.40	$3p\ ^5P^o - 3d\ ^5D$	49.360	1.46+08	1.83-01	1.0-0.0
3362.38	$3s\ ^5P - 3p\ ^5P^o$	46.700	6.90+07	8.40-02	3.0-2.0
3365.92	$3p\ ^5P^o - 3d\ ^3P$	49.400	5.50+07	9.30-02	3.0-3.0
3350.99	$3s\ ^5P - 3p\ ^5P^o$	45.710	1.00+08	1.68-01	3.0-3.0
3350.68	$3s\ ^5P - 3p\ ^5P^o$	45.690	1.18+07	1.13-01	2.0-1.0
3348.08	$3p\ ^5P^o - 3d\ ^5P$	49.410	3.88+07	4.66-02	3.0-2.0
3344.26	$3p\ ^5P^o - 3d\ ^5P$	49.400	2.78+07	6.80-02	2.0-3.0
3344.28	$3p\ ^5P^o - 3d\ ^5P$	49.700	1.25+07	2.10-02	2.0-2.0
3340.74	$3s\ ^3P^o - 3p\ ^1S$	36.890	8.58+07	8.50-02	2.0-1.0
3336.78	$3s\ ^5P - 3p\ ^5P^o$	45.690	3.77+07	6.30-02	1.0-1.0
3336.78	$3s\ ^5P - 3p\ ^5P^o$	49.410	7.00+06	1.17-02	2.0-2.0
3333.40	$3s\ ^5P - 3p\ ^5P^o$	45.700	6.60+07	1.89-01	1.0-2.0
3338.00	$3s\ ^5P - 3p\ ^5P^o$	45.710	5.10+07	1.18-01	2.0-3.0
3332.49	$3s\ ^5P^o - 3d\ ^5P$	49.410	6.30+07	6.30-02	2.0-1.0
3330.40	$3s\ ^5P^o - 3d\ ^5P$	49.410	3.79+07	1.05-01	1.0-2.0
3326.16	$3s\ ^5P^o - 3d\ ^5P$	49.410	2.12+07	3.52-02	1.0-1.0
3312.30	$3s\ ^3P^o - 3p\ ^3S$	36.890	5.20+07	8.60-02	1.0-1.0
3305.77	$3p\ ^3D - 3d\ ^3F^o$	40.230	9.30+05	1.09-03	3.0-2.0
3299.36	$3s\ ^3P^o - 3p\ ^3S$	36.890	1.77+07	8.70-02	0.0-1.0
3284.57	$3p\ ^3D - 3d\ ^3F^o$	40.250	2.26+07	3.66-02	3.0-3.0
3281.94	$3p\ ^3D - 3d\ ^3F^o$	40.230	3.17+07	5.10-02	2.0-2.0

ION	OXYGEN O III				
λ(Å)	Transition	E_k (eV)	A_{ki} (s^{-1})	f_{ik}	J-J
3279.97	$4p\ ^1S - 5d\ ^1P^o$	50.030	2.41+07	1.17-01	0.0-1.0
3267.31	$3p\ ^3D - 3d\ ^3F^o$	40.230	1.73+08	4.62-01	1.0-2.0
3265.46	$3p\ ^3D - 3d\ ^3F^o$	40.270	2.07+08	4.25-01	3.0-4.0
3260.98	$3p\ ^3D - 3d\ ^3F^o$	40.250	1.84+08	4.12-01	2.0-3.0
3215.87	$3p\ ^3D^o - 3d\ ^3D$	50.380	5.80+07	9.10-02	3.0-3.0
3221.20	$3p\ ^3D^o - 3d\ ^3D$	50.320	1.02+07	1.13-02	3.0-2.0
3215.97	$3p\ ^3D^o - 3d\ ^3D$	50.310	5.80+07	9.10-02	3.0-3.0
3210.20	$3p\ ^3D^o - 3d\ ^3D$	50.310	1.65+07	1.55-02	2.0-1.0
3207.12	$3p\ ^3D^o - 3d\ ^3D$	50.310	4.60+07	7.10-02	2.0-2.0
3202.20	$3p\ ^3D^o - 3d\ ^3D$	50.320	7.40+06	1.59-02	2.0-3.0
3200.95	$3p\ ^3D^o - 3d\ ^3D$	50.310	4.99+07	7.70-02	1.0-1.0
3198.20	$3p\ ^3D^o - 3d\ ^3D$	50.320	1.00+07	2.56-02	1.0-2.0
3152.86	$3p\ ^1S - 3d\ ^1P^o$	49.860	1.36+08	5.35-01	1.0-2.0
3121.71	$3p\ ^1S - 3d\ ^1P^o$	49.860	1.38+08	2.81-01	1.0-1.0
3115.73	$3p\ ^1S - 3d\ ^1P^o$	49.870	1.39+08	6.70-02	1.0-0.0
3095.81	$3p\ ^5D^o - 3d\ ^5D$	49.360	1.32+07	1.47-02	4.0-3.0
3058.04	$3p\ ^5D^o - 3d\ ^5D$	49.370	5.20+07	7.40-02	4.0-4.0
3084.63	$3p\ ^5D^o - 3d\ ^5D$	49.360	2.48+07	2.53-02	2.0-2.0
3083.65	$3p\ ^5D^o - 3d\ ^5D$	49.360	3.11+07	4.45-02	3.0-3.0
3075.95	$3p\ ^5D^o - 3d\ ^5D$	49.370	1.04+07	1.90-02	3.0-4.0
3075.19	$3p\ ^5D^o - 3d\ ^5D$	49.360	1.57+07	2.22-02	2.0-2.0
3074.68	$3p\ ^5D^o - 3d\ ^5D$	49.360	3.45+07	3.10-02	2.0-1.0
3074.15	$3p\ ^5D^o - 3d\ ^5D$	49.360	1.80+07	3.55-02	2.0-3.0
3068.68	$3p\ ^5D^o - 3d\ ^5D$	49.360	2.20+07	6.20-02	1.0-2.0
3068.48	$3p\ ^5D^o - 3d\ ^5D$	49.370	2.34+07	3.30-02	1.0-1.0
3068.06	$3p\ ^5P^o - 3d\ ^5D$	49.360	6.30+07	2.96-02	1.0-0.0
3068.00	$3p\ ^5P^o - 3d\ ^5D$	49.360	6.30+07	2.96-02	1.0-0.0
3065.01	$3p\ ^5D^o - 3d\ ^5D$	49.360	2.10+07	8.90-02	0.0-1.0
3059.30	$3s\ ^3P^o - 3p\ ^3P$	37.250	8.40+07	7.00-02	2.0-1.0
3047.13	$3s\ ^3P^o - 3p\ ^3P$	37.250	1.52+08	2.11-01	2.0-2.0
3043.02	$3s\ ^3P^o - 3p\ ^3P$	37.220	2.03+08	9.40-02	1.0-0.0
3035.43	$3s\ ^3P^o - 3p\ ^3P$	37.230	2.31+08	7.10-02	1.0-1.0
3024.57	$3s\ ^3P^o - 3p\ ^3P$	37.230	6.90+07	1.54-01	0.0-1.0
3024.36	$3p\ ^3D - 3d\ ^3D^o$	40.670	1.04+07	1.02-02	3.0-2.0
3023.45	$3s\ ^3P^o - 3p\ ^3P$	37.250	5.20+07	1.19-01	1.0-2.0
3017.63	$3p\ ^3D - 3d\ ^3D^o$	40.680	5.90+07	8.10-02	3.0-3.0
3008.79	$3p\ ^3D - 3d\ ^3D^o$	40.670	1.34+07	1.09-02	2.0-1.0
3004.35	$3p\ ^3D - 3d\ ^3D^o$	40.670	4.72+07	6.40-02	2.0-2.0
2997.71	$3p\ ^3D - 3d\ ^1D^o$	40.580	7.60+06	1.44-02	2.0-3.0
2996.51	$3p\ ^3D - 3d\ ^3D^o$	40.670	5.10+07	6.90-02	1.0-1.0
2992.11	$3p\ ^3D - 3d\ ^3D^o$	40.670	8.20+06	1.83-02	1.0-2.0
2983.78	$3s\ ^3P^o - 3p\ ^1D$	38.010	2.24+08	4.99-01	1.0-2.0
2695.49	$3p\ ^3S^o - 3d\ ^3P$	49.630	2.09+08	3.79-01	1.0-2.0
2687.53	$3p\ ^3S^o - 3d\ ^3P$	49.650	2.11+08	2.29-01	1.0-1.0
2686.14	$3s\ ^5P - 3p\ ^5S^o$	46.620	1.38+08	1.07-01	3.0-2.0
2683.66	$3p\ ^3S^o - 3d\ ^3P$	49.650	2.12+08	7.60-02	1.0-0.0
2674.57	$3s\ ^5P - 3p\ ^5S^o$	46.620	1.00+08	1.07-01	2.0-2.0
2665.69	$3s\ ^5P - 3p\ ^5S^o$	46.620	6.00+07	1.07-01	1.0-2.0
2609.60	$3d\ ^3P^o - 4p\ ^3S$	45.630	1.90+07	5.80-02	0.0-1.0
2605.41	$3d\ ^3P^o - 4p\ ^3S$	45.620	5.80+07	5.90-02	1.0-1.0

ION	OXYGEN O III				
λ (Å)	Transition	E_k (eV)	A_{ki} (s^{-1})	f_{ik}	J-J
2597.69	$3d\ ^3P^o - 4p\ ^3S$	45.620	9.70+07	5.90-02	2.0-1.0
2558.06	$3d\ ^1F^o - 4p\ ^1D$	45.980	1.16+08	8.10-02	3.0-2.0
2454.99	$3s\ ^3P^o - 3p\ ^3S$	38.900	4.00+08	1.20-01	1.0-1.0
835.19	$2p^1\ ^3P - 2p^3\ ^3D^o$	14.880	8.40+08	1.20-01	2.0-3.0
835.10	$2p^1\ ^3P - 2p^3\ ^3D^o$	14.880	2.38+07	1.50-03	2.0-1.0
835.10	$2p^1\ ^3P - 2p^3\ ^3D^o$	14.880	2.10+08	2.20-02	2.0-2.0
835.00	$2p^1\ ^3P - 2p^3\ ^3D^o$	14.880	8.40+08	1.20-01	2.0-3.0
833.74	$2p^1\ ^3P - 2p^3\ ^3D^o$	14.880	3.50+08	3.60-02	1.0-1.0
833.74	$2p^1\ ^3P - 2p^3\ ^3D^o$	14.880	6.30+08	1.10-01	1.0-2.0
833.00	$2p^1\ ^3P - 2p^3\ ^3D^o$	14.880	3.50+08	3.60-02	1.0-1.0
832.93	$2p^1\ ^3P - 2p^3\ ^3D^o$	14.880	4.70+08	1.50-01	0.0-1.0
832.00	$2p^1\ ^3P - 2p^3\ ^3D^o$	14.880	4.70+08	1.50-01	0.0-1.0
703.85	$2p^1\ ^3P - 2p^3\ ^3P^o$	17.650	1.90+09	1.40-01	2.0-2.0
703.85	$2p^1\ ^3P - 2p^3\ ^3P^o$	17.650	1.00+09	4.60-02	2.0-1.0
703.85	$2p^1\ ^3P - 2p^3\ ^3P^o$	17.650	1.90+09	1.40-01	2.0-2.0
702.90	$2p^1\ ^3P - 2p^3\ ^3P^o$	17.650	6.20+08	7.60-02	1.0-2.0
702.90	$2p^1\ ^3P - 2p^3\ ^3P^o$	17.650	6.20+08	4.60-02	1.0-1.0
702.90	$2p^1\ ^3P - 2p^3\ ^3P^o$	17.650	6.20+08	7.60-02	1.0-2.0
702.82	$2p^1\ ^3P - 2p^3\ ^3P^o$	17.650	2.50+08	6.10-02	1.0-0.0
702.33	$2p^1\ ^3P - 2p^3\ ^3P^o$	17.650	8.20+08	1.80-01	0.0-1.0
599.60	$2p^2\ ^1D - 2p^3\ ^1D^o$	25.190	6.80+09	3.70-01	2.0-2.0
597.82	$2p^2\ ^1S - 2p^3\ ^1P^o$	26.090	2.10+09	3.50-01	0.0-1.0
525.79	$2p^2\ ^1D - 2p^3\ ^1P^o$	26.060	1.00+10	2.50-01	2.0-1.0
508.18	$2p^2\ ^3P - 2p^3\ ^3S^o$	24.430	8.20+08	1.90-01	2.0-1.0
507.68	$2p^2\ ^3P - 2p^3\ ^3S^o$	24.430	5.00+09	1.90-01	1.0-1.0
507.39	$2p^2\ ^3P - 2p^3\ ^3S^o$	24.430	1.70+09	1.90-01	0.0-1.0
484.03	$2p^2\ ^3S - 3s\ ^4P^o$	28.940	8.40+06	5.00-04	1.5-1.5
434.97	$2p^2\ ^3S - 3s\ ^3P^o$	33.860	1.30+09	1.10-01	0.0-1.0
395.54	$2p^2\ ^1D - 3s\ ^1P^o$	33.860	6.80+09	9.60-02	2.0-1.0
374.44	$2p^2\ ^3P - 3s\ ^3P^o$	33.150	1.60+09	2.00-02	2.0-1.0
374.33	$2p^2\ ^3P - 3s\ ^3P^o$	33.130	3.80+09	2.70-02	1.0-0.0
374.17	$2p^2\ ^3P - 3s\ ^3P^o$	33.150	9.60+08	2.00-02	1.0-1.0
374.08	$2p^2\ ^3P - 3s\ ^3P^o$	33.180	2.90+09	6.10-02	2.0-2.0
374.00	$2p^2\ ^3P - 3s\ ^3P^o$	33.150	1.30+09	8.10-02	0.0-1.0
373.80	$2p^2\ ^3P - 3s\ ^3P^o$	33.180	9.60+08	3.40-02	1.0-2.0
345.31	$2p^2\ ^1S - 3d\ ^1P^o$	41.260	9.80+09	5.30-01	0.0-1.0
328.45	$2p^2\ ^1D - 3d\ ^1D^o$	40.260	6.10+09	9.90-02	2.0-2.0
320.98	$2p^2\ ^1D - 3d\ ^1F^o$	41.140	1.90+10	4.10-01	2.0-3.0
305.88	$2p^2\ ^3P - 3d\ ^3D^o$	40.570	5.10+08	4.30-03	2.0-1.0
305.84	$2p^2\ ^3P - 3d\ ^3D^o$	40.570	4.60+09	6.40-02	2.0-2.0
305.77	$2p^1\ ^3P - 3d\ ^3D^o$	40.580	1.80+10	3.60-01	2.0-3.0
305.70	$2p^1\ ^3P - 3d\ ^3D^o$	40.570	7.60+09	1.10-01	1.0-1.0
305.66	$2p^1\ ^3P - 3d\ ^3D^o$	40.580	1.40+10	3.20-01	1.0-2.0
305.60	$2p^1\ ^3P - 3d\ ^3D^o$	40.570	1.00+10	4.30-01	0.0-1.0
303.80	$2p^1\ ^3P - 3d\ ^3P^o$	40.850	7.60+09	4.10-01	2.0-2.0
303.69	$2p^2\ ^3P - 3d\ ^3P^o$	40.860	1.20+09	3.50-02	2.0-1.0
303.62	$2p^1\ ^3P - 3d\ ^3P^o$	40.850	2.50+09	5.90-02	1.0-2.0
303.51	$2p^1\ ^3P - 3d\ ^3P^o$	40.860	2.60+09	3.50-02	1.0-1.0
303.46	$2p^1\ ^3P - 3d\ ^3P^o$	40.870	1.00+ 0	4.70-02	1.0-0.0
303.41	$2p^1\ ^3P - 3d\ ^3P^o$	40.860	3.40+09	1.40-01	0.0-1.0
302.34	$2p^1\ ^1D - 3d\ ^1P^o$	41.260	6.40+08	5.20-03	2.0-1.0

ION OXYGEN O IV

λ (Å)	Transition	E_k (eV)	A_{ki} (s^{-1})	f_{ik}	J-J
13201.00(T)	$6s\ ^2S - (^4P^o)4s\ ^2P^o$			5.24-01	
12725.00(T)	$4d\ ^4D - (^4P^o)5s\ ^4P^o$			4.00-03	
11876.00(T)	$3d\ ^2P^o - 7s\ ^2S$			3.58-02	
11685.00(T)	$5p\ ^2P^o - (^4P^o)5p\ ^2S$			7.94-02	
11582.00(T)	$6d\ ^2D - (^4P^o)5d\ ^2P^o$			1.08-01	
11485.00(E)	$4d\ ^2D - (^4P^o)5d\ ^2P^o$			1.20-03	
10907.00(T)	$4s\ ^4P^o - (^4P)5s\ ^4P$			1.05-02	
10338.00(T)	$4s\ ^2P^o - 7s\ ^2S$			1.71-01	
10275.00(T)	$2s^2 2p - (^4P)3s\ ^2P$			1.80-03	
7852.00(E)	$3d\ ^2P^o - (^4P)5s\ ^2P$			1.10-03	
7454.00(T)	$3d\ ^2P^o - (^4P)5s\ ^2P$			1.10-03	
7347.00(T)	$3d\ ^4P^o - (^4P)4f\ ^2D$			5.80-04	
7409.00(T)	$3s\ ^2P^o - (^2P^o)5p\ ^2P$	57.930		7.34-02	
6982.00(E)	$3s\ ^2P^o - (^2P^o)5p\ ^2P$	57.930		7.34-02	
6970.00(T)	$6s\ ^2S - (^4P^o)5d\ ^2P^o$			2.76-01	
6718.00(T)	$3p\ ^2S - 6p\ ^2P^o$			2.38-01	
6612.00(T)	$4s\ ^2P^o - (^4P^o)4d\ ^4P^o$			7.10-03	
6528.00(T)	$2s^2 2p - (^4D)3s\ ^2D$			3.44-02	
6180.00(T)	$4s\ ^2P^o - (^2P^o)4d\ ^4P^o$			7.10-03	
6120.00(T)	$3p\ ^2D - 4p\ ^2P^o$			7.70-03	
5445.00(E)	$3d\ ^2P^o - (^4D)3s\ ^2D$			9.00-06	
5378.30	$3p\ ^2D - 3d\ ^2D^o$	62.180	7.40+05	2.10-03	2.5-1.5
5362.40	$3p\ ^2D - 3d\ ^2D^o$	62.180	6.90+06	2.99-02	2.5-2.5
5351.00(T)	$3p\ ^2S - (^2P)4s\ ^2P^o$			1.19-01	
5305.30	$3p\ ^2D - 3d\ ^2D^o$	62.180	6.90+06	2.91-02	2.5-2.5
5290.10	$3p\ ^2D - 3d\ ^2D^o$	62.180	5.20+05	3.20-03	1.5-2.5
5263.00(T)	$3d\ ^2P - (^2D)3s\ ^2D$			9.00-06	
5216.00(E)	$3p\ ^2S - (^2P)4s\ ^2P^o$			1.19-01	
5044.00(T)	$3p\ ^2P - 6p\ ^2P^o$			6.00-04	
4912.00(T)	$3p\ ^4P - (^2P^o)3d\ ^4D^o$	61.930		1.63-01	
4846.00(E)	$4s\ ^4P^o - (^2P)3s\ ^2P$			8.75-02	
4840.00(E)	$3s\ ^2P^o - 5s\ ^2S$			1.63-02	
4823.93	$3p\ ^4P - 3d\ ^4D^o$	61.930	1.48+06	3.40-03	2.5-1.5
4813.07	$3p\ ^4P - 3d\ ^4D^o$	61.940	9.00+06	3.11-02	2.5-2.5
4800.77	$3p\ ^4P - 3d\ ^4D^o$	61.930	5.00+06	8.70-03	1.5-0.5
4798.25	$3p\ ^4P - 3d\ ^4D^o$	61.940	3.03+07	1.30-01	2.5-3.5
4794.22	$3p\ ^4P - 3d\ ^4D^o$	61.930	1.61+07	5.60-02	1.5-1.5
4794.00(E)	$3p\ ^4P - (^2P^o)3d\ ^4D^o$	61.930		1.63-01	
4783.43	$3p\ ^4P - 3d\ ^4D^o$	61.940	2.13+07	1.10-01	0.5-2.5
4779.09	$3p\ ^4P - 3d\ ^4D^o$	61.930	2.54+07	8.70-02	0.5-0.5
4772.57	$3p\ ^4P - 3d\ ^4D^o$	61.930	1.28+07	8.70-02	0.5-1.5
4685.40	$3p\ ^2S - 3d\ ^2P^o$	63.760	2.95+07	1.94-01	0.5-1.5
4652.50	$3p\ ^2S - 3d\ ^2P^o$	61.950	3.01+07	9.80-02	0.5-0.5
4587.00(E)	$5d\ ^2D - (^4P^o)4s\ ^2P^o$			1.28-02	
4568.00	$5f\ ^4F^o - (^4S)6d\ ^2D$	71.210	1.24+07	2.78-02	3.5-2.5
4539.00(T)	$5d\ ^2D - (^4P^o)4s\ ^2P^o$			1.28-02	
4491.00(T)	$4s\ ^2P^o - (^2P)3s\ ^2P$			8.75-02	
4479.00(T)	$3p\ ^2D - 6p\ ^2P^o$			4.10-03	
4452.00(T)	$4s\ ^2P^o - (^2P^o)4f\ ^2D$			3.00-04	
4232.00(T)	$3p\ ^2P - (^2P^o)4s\ ^2P^o$			9.00-04	

ION OXYGEN O IV

λ (Å)	Transition	E_k (eV)	A_{ki} (s^{-1})	f_{ik}	J-J
4826.00(T)	$3s\ ^2P^o - 5s\ ^2S$	0.000	0.00+00	1.63-02	0.5-0.5
4271.00(T)	$3d\ ^2D^o - 5s\ ^2S$	0.000	0.00+00	4.60-03	0.5-0.5
4168.00(E)	$3p\ ^4D - (^3P^o)3d\ ^4D^o$	0.000	0.00+00	4.56-02	0.5-0.5
4166.00(E)	$3p\ ^2P - (^3P^o)4s\ ^2P^o$	0.000	0.00+00	9.00-04	0.5-0.5
4027.00(T)	$3p\ ^4P - (^3P^o)3d\ ^4P^o$	0.000	0.00+00	5.16-02	0.5-0.5
3995.17	$3p\ ^4P - 3d\ ^4P^o$	62.460	2.16+07	5.10-02	2.5-2.5
3984.00(E)	$3d\ ^2P^o - 6s\ ^2S$	0.000	0.00+00	4.60-03	0.5-0.5
3977.10	$3p\ ^4P - 3d\ ^4P^o$	62.480	1.40+07	2.21-02	2.5-1.5
3974.66	$3p\ ^4P - 3d\ ^4P^o$	62.460	9.40+06	3.32-02	1.5-2.5
3973.00(E)	$3p\ ^4P - (^3P^o)3d\ ^4P^o$	0.000	0.00+00	5.16-02	0.5-0.5
3956.82	$3p\ ^4P - 3d\ ^4P^o$	62.480	4.25+06	1.00-02	1.5-1.5
3945.29	$3p\ ^4P - 3d\ ^4P^o$	62.490	2.66+07	3.10-02	1.5-0.5
3942.14	$3p\ ^4P - 3d\ ^4P^o$	62.480	1.33+07	6.20-02	0.5-1.5
3930.63	$3p\ ^4P - 3d\ ^4P^o$	62.490	5.30+06	1.24-02	0.5-0.5
3836.00(T)	$6p\ ^2P^o - (^3P)3s\ ^2P$	0.000	0.00+00	3.76-02	0.5-0.5
3827.00(T)	$3p\ ^2D - (^3P^o)4s\ ^2P^o$	0.000	0.00+00	7.70-03	0.5-0.5
3807.00(E)	$4s\ ^2P^o - (^1D)3s\ ^2D$	0.000	0.00+00	2.22-02	0.5-0.5
3807.00(T)	$6p\ ^2P^o - (^3P^1)4f\ ^2D$	0.000	0.00+00	1.11-02	0.5-0.5
3775.00(E)	$3p\ ^2D - (^3P^o)4s\ ^2P^o$	0.000	0.00+00	4.10-03	0.5-0.5
3774.38	$3p\ ^4D - 3d\ ^4F^o$	61.370	7.50+05	1.20-03	3.5-2.5
3758.45	$3p\ ^4D - 3d\ ^4F^o$	61.370	1.12+07	2.37-02	3.5-3.5
3755.82	$3p\ ^4D - 3d\ ^4F^o$	61.360	1.58+06	2.20-03	2.5-1.5
3744.73	$3p\ ^4D - 3d\ ^4F^o$	61.370	1.94+07	4.07-02	2.5-2.5
3736.78	$3p\ ^4D - 3d\ ^4F^o$	61.400	8.00+07	2.09-01	3.5-4.5
3736.78	$3p\ ^4D - 3d\ ^4F^o$	61.360	2.24+07	4.69-02	1.5-1.5
3729.03	$3p\ ^4D - 3d\ ^4F^o$	61.380	6.90+07	1.93-01	2.5-3.5
3725.81	$3p\ ^4D - 3d\ ^4F^o$	61.370	6.10+07	1.90-01	1.5-2.5
3725.81	$3p\ ^4D - 3d\ ^4F^o$	61.360	5.70+07	2.36-01	0.5-1.5
3694.00(E)	$3p\ ^2S - (^3P^o)3d\ ^2P^o$	0.000	0.00+00	2.42-01	0.5-0.5
3631.00(T)	$3p\ ^2S - (^3P^o)3d\ ^2P^o$	0.000	0.00+00	2.42-01	0.5-0.5
3595.10	$3p\ ^2D - 3d\ ^2F^o$	63.330	7.50+06	1.46-02	2.5-2.5
3590.00(T)	$4s\ ^2P^o - (^1D)3s\ ^2D$	0.000	0.00+00	2.22-02	0.5-0.5
3563.36	$3p\ ^2D - 3d\ ^2F^o$	63.350	1.15+08	2.91-01	2.5-3.5
3560.42	$3p\ ^2D - 3d\ ^2F^o$	63.320	1.08+08	3.07-01	1.5-2.5
3492.24	$3s'\ ^2P^o - 3p'\ ^2D$	67.850	8.20+07	3.00-01	0.5-1.5
3492.20	$3s'\ ^2P^o - 3p'\ ^2D$	67.880	1.65+07	3.02-02	1.5-1.5
3492.00(E)	$3s\ ^1P^o - (^1P^o)3p\ ^2D$	67.850	0.00+00	1.94-01	0.5-0.5
3489.84	$3s'\ ^2P^o - 3p'\ ^2D$	67.860	9.90+07	2.72-01	1.5-2.5
3425.57	$3s\ ^4P^o - 3p\ ^4D$	58.040	5.10+06	6.00-03	2.5-1.5
3417.00(T)	$3s\ ^1P^o - (^1P^o)3p\ ^1D$	0.000	0.00+00	1.94-01	0.5-0.5
3415.71	$3p\ ^2P^o - 3d\ ^2D$	52.010	1.91+07	3.34-02	1.5-1.5
3411.76	$3p\ ^2P^o - 3d\ ^2D$	52.010	1.15+08	3.00-01	1.5-2.5
3409.75	$3s\ ^4P^o - 3p\ ^4D$	58.060	3.10+07	5.40-02	2.5-2.5
3409.00	$3p\ ^2P^o - 3d\ ^2D$	52.010	0.00+00	3.01-01	0.5-0.5
3405.97	$3s\ ^4P^o - 3p\ ^4D$	58.030	1.72+07	1.49-02	1.5-0.5
3403.58	$3p\ ^4P^o - 3d\ ^4D$	52.010	9.60+07	3.35-01	0.5-1.5
3396.83	$3s\ ^4P^o - 3p\ ^4D$	58.040	5.60+07	9.60-02	1.5-1.5
3396.37	$3s\ ^4P^o - 3p\ ^4D$	58.030	8.80+07	1.51-01	0.5-0.5
3389.00(E)	$3s\ ^4P^o - 3p\ ^4D$	58.030	0.00+00	2.97-01	0.5-0.5
3387.00(T)	$3s\ ^4P^o - 3p\ ^4D$	58.030	0.00+00	2.97-01	0.5-0.5

ION	OXYGEN O IV				
λ (Å)	Transition	E_k (eV)	A_{ki} (s^{-1})	f_{ik}	J-J
3387.00(T)	$3p\ ^2P - 3d\ ^2D$	0.000	0.00+00	3.01-01	0.0-0.0
3385.56	$3s\ ^4P^o - 3p\ ^4D$	58.080	1.06+08	2.42-01	2.5-3.5
3384.00(E)	$4s\ ^4P^o - (^3P)\,3p\ ^4P^o$	0.000	0.00+00	1.67-01	0.0-0.0
3381.33	$3s\ ^4P^o - 3p\ ^4D$	58.040	4.42+07	1.51-01	0.5-1.5
3381.28	$3s\ ^4P^o - 3p\ ^4D$	58.060	7.40+07	1.91-01	1.5-2.5
3378.09	$3s\ ^2P^o - 3p\ ^2D$	59.840	2.01+07	3.44-02	1.5-1.5
3378.00(T)	$4s\ ^4P^o - (^3P)\,3p\ ^4P^o$	0.000	0.00+00	1.67-01	0.0-0.0
3375.50	$3p\ ^4S - 3d\ ^4P^o$	62.460	6.80+07	1.75-01	1.5-2.5
3369.00(E)	$3p\ ^4S - (^3P^o)\,3d\ ^2P^o$	62.460	0.00+00	3.90-01	0.0-0.0
3367.00(E)	$5d\ ^2D - (^3P^o)\,3d\ ^2P^o$	0.000	0.00+00	7.70-03	0.0-0.0
3362.63	$3p\ ^4S - 3d\ ^4P^o$	62.460	6.90+07	1.17-01	1.5-1.5
3361.00(T)	$3p\ ^4S - (^3P^o)\,3d\ ^4P^o$	62.460	0.00+00	3.90-01	0.0-0.0
3354.31	$3p\ ^4S - 3d\ ^4P^o$	62.490	6.90+07	5.80-02	1.5-0.5
3352.00(E)	$3s\ ^2P^o - (^3P^o)\,3p\ ^2D$	59.870	0.00+00	2.85-01	0.0-0.0
3349.11	$3s\ ^2P^o - 3p\ ^2D$	59.870	1.23+08	3.11-01	1.5-2.5
3348.08	$3s\ ^2P^o - 3p\ ^2D$	59.840	1.03+08	3.45-01	0.5-1.5
3340.00(T)	$3s\ ^2P^o - (^3P^o)\,3p\ ^2D$	59.840	0.00+00	2.85-01	0.0-0.0
3238.00(T)	$5d\ ^4D - (^4P^o)\,3d\ ^4P$	0.000	0.00+00	7.70-03	0.0-0.0
3216.31	$3p\ ^4D - 3d\ ^4D^o$	61.940	6.30+06	7.30-03	3.5-2.5
3215.00(E)	$3s\ ^2P^o - (^1P^o)\,3p\ ^2P^o$	0.000	0.00+00	1.50-01	0.0-0.0
3209.64	$3p\ ^4D - 3d\ ^4D^o$	61.940	2.86+07	4.42-02	3.5-3.5
3203.00(T)	$3p\ ^2S - 7p\ ^2P^o$	0.000	0.00+00	3.00-04	0.0-0.0
3199.53	$3p\ ^4D - 3d\ ^4D^o$	61.930	1.18+07	1.20-02	2.5-1.5
3196.00(T)	$3p\ ^4D - (^3P^o)\,3d\ ^4D^o$	61.940	0.00+00	4.56-02	0.0-0.0
3194.75	$3p\ ^4D - 3d\ ^4D^o$	61.940	1.94+07	2.96-02	2.5-2.5
3188.65	$3p\ ^4D - 3d\ ^4D^o$	61.930	1.72+07	1.31-02	1.5-0.5
3188.17	$3p\ ^4D - 3d\ ^4D^o$	61.950	4.85+06	9.80-03	2.5-3.5
3185.72	$3p\ ^4D - 3d\ ^4D^o$	61.930	1.36+07	2.07-02	1.5-1.5
3180.98	$3p\ ^4D - 3d\ ^4D^o$	61.940	8.00+06	1.81-02	1.5-2.5
3180.72	$3p\ ^4D - 3d\ ^4D^o$	61.940	1.73+07	2.63-02	0.5-0.5
3180.00(E)	$3p\ ^2D - (^3P^o)\,3d\ ^2P^o$	0.000	0.00+00	7.10-03	0.0-0.0
3177.80	$3p\ ^4D - 3d\ ^4D^o$	61.930	8.70+06	2.63-02	0.5-1.5
3159.00(T)	$6p\ ^2P^o - (^2D)\,3s\ ^2D$	0.000	0.00+00	4.69-02	0.0-0.0
3148.00(T)	$3s\ ^2P^o - (^1P^o)\,3p\ ^2P$	0.000	0.00+00	1.50-01	0.0-0.0
3141.08(T)	$3s\ ^2P^o - 4s\ ^2S^o$	60.230	0.00+00	3.82-02	0.0-0.0
3135.00(E)	$3p\ ^2P - (^1P^o)\,3d\ ^2P^o$	0.000	0.00+00	5.04-02	0.0-0.0
3129.08(T)	$3d\ ^2P^o - (^1P^o)\,3d\ ^2D$	0.000	0.00+00	4.08-02	0.0-0.0
3128.00(T)	$3p\ ^2D - (^1P^o)\,3d\ ^2P^o$	0.000	0.00+00	7.10-03	0.0-0.0
3079.00(T)	$3p\ ^2P - (^1P^o)\,3d\ ^2P^o$	0.000	0.00+00	5.04-02	0.0-0.0
3071.66	$3s\ ^2S - 3p\ ^2P^o$	48.370	1.47+08	2.08-01	0.5-0.5
3066.00(E)	$3s\ ^2S^o - 3p\ ^2P^o$	48.370	0.00+00	5.56-01	0.0-0.0
3063.48	$3s\ ^2S - 3p\ ^2P^o$	48.389	1.48+08	4.16-01	0.5-1.5
3059.00(T)	$3s\ ^2S^o - 3p\ ^2P^o$	48.380	0.00+00	5.56-01	0.0-0.0
3048.00(T)	$3p\ ^2P - 4p\ ^2P^o$	0.000	0.00+00	5.40-03	0.0-0.0
3046.00(E)	$3s\ ^2P^o - 4s\ ^2S^o$	60.230	0.00+00	3.82-02	0.0-0.0
3023.00(E)	$3d\ ^4P^o - (^3P^o)\,3d\ ^2D$	0.000	0.00+00	4.08-02	0.0-0.0
3000.00(E)	$3s\ ^4P^o - 5d\ ^2D$	0.000	0.00+00	1.45-02	0.0-0.0
2997.00(T)	$3s\ ^4P^o - 5d\ ^2D$	0.000	0.00+00	1.45-02	0.0-0.0
2990.00(E)	$3d\ ^4D - (^3P^o)\,3s\ ^2P^o$	0.000	0.00+00	1.15-02	0.0-0.0
2984.00(T)	$3d\ ^4D - (^3P^o)\,3s\ ^2P^o$	0.000	0.00+00	1.15-02	0.0-0.0

ION	OXYGEN O IV				
λ (Å)	Transition	E_k (eV)	A_{ki} (s^{-1})	f_{ik}	J-J
2908.00(E)	$3p\ ^2D - (^4P^o)3d\ ^2P^o$			7.70-03	
2901.00(T)	$3d\ ^2P^o - (^4P^o)3p\ ^2S$			3.37-02	
2885.00(T)	$3p\ ^2D - (^4P^o)3s\ ^2P^o$	62.180		5.50-03	
2859.00(T)	$3p\ ^2D - (^4P^o)3d\ ^2P^o$			3.20-03	
2825.00(E)	$3s\ ^4P^o - 3p\ ^4S$			6.97-02	
2815.00(T)	$3s\ ^4P^o - 3p\ ^4S$			6.97-02	
2812.00(E)	$3p\ ^2P^o - (^4P^o)3p\ ^2S$			3.37-02	
2810.00(E)	$3p\ ^4D - (^4P^o)3d\ ^4P^o$	62.460		1.45-02	
2797.00(T)	$3p\ ^4D - (^4P^o)3d\ ^4P^o$	62.480		1.45-02	
2787.00(E)	$3p\ ^2D - (^4P^o)3s\ ^2P^o$	62.480		5.50-03	
2781.00(E)	$3s\ ^2P^o - (^4P^o)3p\ ^2S$			1.79-02	
2773.00(T)	$3d\ ^2P^o - 5d\ ^2D$			4.40-03	
2765.00(T)	$3p\ ^4P - 7p\ ^4P^o$			8.30-03	
2724.00(T)	$3s\ ^2P^o - (^4P^o)3p\ ^2S$			1.63-02	
2648.00(E)	$3d\ ^2P^o - 5d\ ^2D$			4.40-03	
2586.00(T)	$3p\ ^4S - 7p\ ^4P^o$			7.80-04	
2538.00(T)	$3d\ ^2P^o - (^4P^o)3p\ ^2S$			2.37-02	
2511.40	$3s\ ^2P^o - 3p\ ^2S$	61.110	2.01+08	9.50-02	1.5-0.5
2507.00(E)	$3s\ ^2P^o - (^3P^o)3p\ ^2S$			5.50-02	
2506.00(E)	$3s\ ^4P^o - (^3P^o)3p\ ^4P$			2.64-01	
2494.80	$3s\ ^2P^o - 3p\ ^2S$	61.110	1.02+08	9.60-02	0.5-0.5
2479.00(T)	$3s\ ^2P^o - (^3P^o)3p\ ^2S$			5.50-02	
2475.00(E)	$3d\ ^2P^o - (^4P^o)3p\ ^2S$			2.37-02	
2471.00(T)	$3s\ ^4P^o - (^3P^o)3p\ ^4P$			2.64-01	
2282.00(E)	$4d\ ^2D - (^4P^o)3s\ ^2P^o$			4.00-03	
2129.00(E)	$3p\ ^4P - (^3P^o)3d\ ^4P^o$			9.95-02	
2064.00(T)	$3p\ ^2P - (^4P^o)3d\ ^2P^o$			9.95-02	
2004.00(T)	$3s\ ^2P^o - 6s\ ^2S$			1.00-04	
1956.00(T)	$3p\ ^2P - (^4P^o)3s\ ^2P^o$			2.58-02	
1946.00(E)	$3p\ ^2P - (^4P^o)3s\ ^2P^o$			2.58-02	
1901.00(T)	$3d\ ^2P^o - 6s\ ^2S$			2.10-03	
1815.00(T)	$5p\ ^2P^o - (^2D)3s\ ^2D$			1.47-02	
1798.00(T)	$3s\ ^2P^o - 6d\ ^2D$			2.20-03	
1796.00(E)	$3s\ ^2P^o - 6d\ ^2D$			2.20-03	
1762.00(T)	$3s\ ^2P^o - 4d\ ^2D$			7.73-02	
1737.00(E)	$3s\ ^2P^o - 4d\ ^2D$			7.73-02	
1715.00(T)	$3d\ ^2P^o - 6d\ ^2D$			1.60-03	
1706.00(T)	$2p^1\ ^2P^o - 3s\ ^2S$			1.00-05	
1664.00(E)	$3d\ ^2P^o - 6d\ ^2D$			1.60-03	
1592.00(T)	$3p\ ^2D - 5p\ ^2P^o$			2.40-03	
1537.00(T)	$3s\ ^2P^o - 7s\ ^2S$			3.00-04	
1476.00(T)	$3d\ ^2P^o - 7s\ ^2S$			1.30-03	
1458.00(E)	$2p^1\ ^2P^o - 3s\ ^2S$			1.00-05	
1387.00(T)	$4d\ ^2D - (^4P^o)3d\ ^2P^o$			1.20-03	
1345.00(T)	$2p^2\ ^1D - 2p^3\ ^1D$			1.14-01	
1345.08(E)	$2p^2\ ^1D - 2p^3\ ^1D$	31.630		1.14-01	
1339.00(E)	$2p^2\ ^1D - 2p^3\ ^1D$	31.640		1.14-01	
1320.00(E)	$3s\ ^2P^o - (^3P)3s\ ^2P$			2.34-02	
1309.00(T)	$3p\ ^2P^o - (^4P)3p\ ^2P$			1.29-02	
1298.00(E)	$3p\ ^2P^o - (^4P^o)3p\ ^2P$			1.29-02	

ION		OXYGEN O IV			
λ (Å)	Transition	E_k (eV)	A_{ki} (s^{-1})	f_{ik}	J-J
1288.00(1)	$3s\ ^2P^o - (^4P)3s\ ^2P$			2.84-02	
1284.00(T)	$3s\ ^2P^o - (^2P^o)4f\ ^2D$			1.22-01	
1261.00(1)	$3p\ ^2P - 5p\ ^2P^o$			2.70-03	
1251.00(T)	$3d\ ^2D - 4p\ ^2P^o$			4.86-02	
1247.00(E)	$3d\ ^2P^o - (^2P)3s\ ^2S$			8.00-04	
1244.00(T)	$3d\ ^2P^o - (^2P)3s\ ^2S$			8.00-04	
1241.00(T)	$3d\ ^2P^o - (^2P^o)4f\ ^2D$			7.02-01	
1229.00(E)	$3s\ ^2P^o - (^2D)3s\ ^2D$			1.55-01	
1201.00(T)	$3s\ ^2P^o - (^2D)3s\ ^2D$			1.55-01	
1172.00(T)	$3s\ ^2P^o - 5s\ ^2S$			1.10-03	
1165.00(E)	$3d\ ^2P^o - (^2D)3s\ ^2D$			4.23-02	
1164.00(T)	$3d\ ^2P^o - (^2D)3s\ ^2D$			4.23-02	
1159.00(T)	$3p\ ^2D - 6p\ ^2P^o$			3.25-02	
1158.00(E)	$3s\ ^2P^o - 5s\ ^2S$			1.10-03	
1122.00(T)	$3p\ ^4P - (^3P^o)4s\ ^4P^o$			1.70-01	
1110.00(T)	$3p\ ^2D - (^4P^o)4s\ ^2P^o$			7.52-02	
1109.00(E)	$3p\ ^4P - (^3P^o)4s\ ^4P^o$			1.70-01	
1099.00(T)	$3p\ ^2D - (^3P^o)4s\ ^2P^o$			7.52-02	
1080.00(E)	$3p\ ^2P^o - (^3P^o)3p\ ^2D$			6.63-02	
1074.00(T)	$3p\ ^2P^o - (^3P^o)3p\ ^2D$			6.63-02	
1065.00(T)	$3s\ ^2P^o - (^4P^o)3p\ ^2D$			5.63-02	
1063.00(T)	$3p\ ^4S - (^4P^o)4s\ ^4P^o$			3.60-02	
1060.00(E)	$3s\ ^2P^o - (^4P^o)3p\ ^2D$			5.63-02	
1056.00(E)	$3p\ ^4S - (^3P^o)4s\ ^4P^o$			3.60-02	
1056.00(E)	$3d\ ^2D - (^2P^o)3d\ ^2P^o$			8.00-05	
1053.00(T)	$3p\ ^2P^o - 4s\ ^2S$			8.99-02	
1049.00(E)	$3s\ ^2S - (^3P^o)3s\ ^2P^o$			4.52-02	
1047.00(T)	$3d\ ^2D - (^2P^o)3d\ ^2P^o$			8.00-05	
1046.00(T)	$3s\ ^2S - (^3P^o)3s\ ^2P^o$			4.52-02	
1046.00(E)	$3p\ ^2P^o - 4s\ ^2S$			8.99-02	
1038.00(T)	$3s\ ^2P^o - (^4P)3p\ ^2P$			4.00-04	
1033.00(E)	$3s\ ^2P^o - (^4P)3p\ ^2P$			4.00-04	
1031.00(T)	$4s\ ^2S - (^4P^o)3d\ ^2P^o$	12.010	4.09+08	4.30-03	0.5-1.5
1018.00(T)	$3d\ ^2D - (^2P^o)3s\ ^2P^o$			1.10-03	
1020.00(T)	$3s\ ^2P^o - 5d\ ^2D$			5.90-03	
1011.00(E,T)	$3p\ ^2D - (^4P^o)3d\ ^2P^o$			2.00-04	
1010.00(E)	$3s\ ^2P^o - 5d\ ^2D$			5.90-03	
1008.00(E)	$3d\ ^2D - (^4P^o)3s\ ^2P^o$			1.10-03	
999.00(T)	$3p\ ^4P - (^3P^o)4s\ ^2P^o$			9.10-02	
995.00(E)	$3p\ ^2P - (^3P^o)4s\ ^2P^o$			9.10-02	
987.00(T)	$3s\ ^2P^o - (^4P^o)3p\ ^2S$			1.34-02	
985.00(E)	$3s\ ^2P^o - (^4P)3p\ ^2S$			1.34-02	
976.00(T)	$3p\ ^2D - 7p\ ^2P^o$			3.00-04	
974.00(E)	$3p\ ^2P^o - (^3P^o)3p\ ^2S$			2.44-02	
973.00(T)	$3p\ ^2P - 6p\ ^2P^o$			2.68-02	
967.00(T)	$3p\ ^2P^o - (^3P^o)3p\ ^2S$			2.44-02	
959.00(E,T)	$3p\ ^2P - (^3P^o)4s\ ^2P^o$			5.49-02	
922.00(E)	$2p^3\ ^2P^o - 2p^2(^1D)3s\ ^2P$	35.830		1.75-01	
893.00(T)	$3p\ ^4P - (^3P^o)4d\ ^4D^o$			3.06-01	
885.00(T)	$3p\ ^4P - (^3P^o)4d\ ^4D^o$			3.06-01	

ION	OXYGEN O IV				
λ (Å)	Transition	E_k (eV)	A_{ki} (s^{-1})	f_{ik}	J-J
882.00(T)	$3p\ ^4P - (^3P^o)4d\ ^4P^o$			4.19-02	
881.00(T)	$2p^2\ ^2P - 2p^3\ ^2P$			1.73-01	
875.00(E)	$3p\ ^4P - (^3P^o)4d\ ^4P$			8.33-02	
874.00(E)	$3p\ ^2P^o - (^1P^o)3d\ ^2P^o$			4.00-04	
873.00(T)	$3s\ ^2P^o - 6s\ ^2S$			1.00-03	
867.00(T)	$3p\ ^2P^o - (^1P^o)3d\ ^2P^o$			4.00-04	
845.00(T)	$3p\ ^4S - (^3P^o)4d\ ^4P^o$			2.88-01	
842.00(E)	$3p\ ^4S - (^3P^o)4d\ ^4P^o$			2.88-01	
841.00(T)	$2p^3\ ^2P^o - 3d\ ^2D$			1.00-04	
840.00(T)	$3p\ ^2P - 7p\ ^2P^o$			6.00-04	
834.00(T)	$3p\ ^2P^o - 4d\ ^2D$			2.45-01	
832.00(T)	$3s\ ^2P^o - 6d\ ^2D$			2.60-03	
831.00(E)	$3p\ ^2P^o - 4d\ ^2D$			2.45-01	
824.00(E)	$3s\ ^2P^o - 6d\ ^2D$			2.60-03	
814.00(T)	$3p\ ^4D - (^3P^o)4d\ ^4D^o$			6.50-02	
810.00(E)	$3p\ ^4D - (^4P^o)4d\ ^4D^o$			6.50-02	
806.00(E)	$3p\ ^4P - (^3P)3d\ ^4D^o$			5.33-02	
805.00(T)	$3p\ ^4P - (^3P)3d\ ^4D^o$			5.33-02	
804.00(T)	$3p\ ^4D - (^3P^o)4d\ ^4P^o$			6.00-04	
802.00(E)	$3p\ ^4D - (^4P^o)4d\ ^4P^o$			6.00-04	
802.00(E,T)	$2p^2\ ^2S - 2p^3\ ^2P$	35.830		1.13-01	
791.00(T)	$3d\ ^2D - 5p\ ^2P^o$			1.19-02	
790.20	$2p\ ^2P^o - 2p^2\ ^2D$	15.740	9.60+08	1.30-01	1.5-2.5
790.10	$2p\ ^2P^o - 2p^2\ ^2D$	15.740	1.50+08	1.40-02	1.5-1.5
789.00(E)	$2p\ ^2P - 2p^2\ ^2D$			1.10-01	
787.71	$2p\ ^2P^o - 2p^2\ ^2D$	15.740	8.00+08	1.50-01	0.5-1.5
780.00(E)	$2p^2\ ^2D - 2p^3\ ^2D$	31.630		1.31-01	
779.00(T)	$2p\ ^2P - 2p^2\ ^2D$	31.640		1.10-01	
772.00(T)	$2p^2\ ^2D - 2p^3\ ^2D$			1.31-01	
766.00(E)	$2p^3\ ^4P^o - 3d\ ^4F$			1.00-04	
757.00(E)	$3p\ ^4S - (^3P)3p\ ^4P^o$			1.82-01	
753.00(T)	$3p\ ^4S - (^3P)3p\ ^4P^o$			1.82-01	
743.00(E)	$3p\ ^4D - (^3P)3p\ ^4D^o$			1.40-01	
740.00(T)	$3p\ ^4D - (^3P)3p\ ^4D^o$			1.40-01	
725.00(E)	$3p\ ^4P - 3p\ ^4S^o$			7.28-02	
725.00(E)	$3s\ ^4P^o - (^3P)3s\ ^4P$			2.19-01	
724.00(E)	$3p\ ^4D - (^3P)3p\ ^4P^o$			5.20-02	
721.00(T)	$3p\ ^4P - 3p\ ^4S$			7.28-02	
721.00(T)	$3s\ ^4P^o - (^3P)3s\ ^4P$			2.19-01	
710.00(T)	$3p\ ^4D - (^3P)3p\ ^4P^o$			5.20-02	
707.00(E)	$3s\ ^2P^o - (^3P)3s\ ^2P$			1.07-01	
704.00(T)	$3s\ ^2S - 4p\ ^2P^o$			1.64-01	
703.00(T)	$3s\ ^2P^o - (^3P)3s\ ^2P$			1.07-01	
702.00(T)	$3s\ ^2P^o - (^3P)4f\ ^2D$			4.00-03	
680.00(E)	$3s\ ^2P^o - (^4D)3s\ ^2D$			7.00-04	
676.00(T)	$3s\ ^2P^o - (^2D)3s\ ^2D$			7.00-04	
674.00(T)	$3p\ ^2P^o - 5s\ ^2S$			3.43-02	
670.00(E)	$3p\ ^2P^o - 5s\ ^2S$			3.43-02	
667.00(T)	$3d\ ^2D - 6p\ ^4P^o$			8.40-03	
651.00(T)	$3d\ ^2D - (^3P^o)4s\ ^2P^o$			1.00-03	

ION OXYGEN O IV

λ (Å)	Transition	E_k (eV)	A_{ki} (s^{-1})	f_{ik}	J-J
648.00(E)	$3d\ ^1D - (^3P^o)4s\ ^2P^o$			1.00-03	
637.00(T)	$3p\ ^1P^o - (^1P^o)3p\ ^2D$			2.07-01	
636.00(E)	$3p\ ^1P - (^1P^o)3p\ ^2D$			2.07-01	
635.00(T)	$3s\ ^2S - (^3P^o)3d\ ^2P^o$			2.47-02	
627.00(E,T)	$3p\ ^2P^o - (^1P^o)3p\ ^2P$			1.78-01	
625.85	$2p^2\ ^4P - 2p^3\ ^4S^o$	28.670	3.90+09	1.50-01	2.5-1.5
625.13	$2p^2\ ^4P - 2p^3\ ^4S^o$	28.670	2.50+09	1.50-01	1.5-1.5
625.00(E)	$2p^2\ ^4P - 2p^3\ ^4S$	28.670		1.28-01	
624.62	$2p^2\ ^4P - 2p^3\ ^4S^o$	28.670	1.20+09	1.40-01	0.5-1.5
624.00(T)	$3s\ ^2S - (^4P^o)3s\ ^2P^o$			4.44-01	
624.00(T)	$2p^3\ ^2D^o - 3d\ ^2D$			4.00-05	
621.00(E)	$3s\ ^2S - (^4P^o)3s\ ^2P^o$			4.44-01	
621.00(T)	$3p\ ^2P^o - 5d\ ^2D$			7.87-02	
618.00(E)	$3p\ ^2P^o - 5d\ ^2D$			7.87-02	
617.00(E)	$3d\ ^2D - (^4P^o)3d\ ^2P^o$			8.75-02	
617.00(E)	$2p^2\ ^2D - 2p^3\ ^2P$	35.850		1.05-01	
615.00(T)	$3d\ ^2D - (^4P^o)3d\ ^2P^o$			8.75-02	
611.00(T)	$2p^2\ ^4P - 2p^3\ ^4S$			1.28-01	
609.83	$2p\ ^2P^o - 2p^2\ ^2S$	20.380	3.60+09	1.00-01	1.5-0.5
609.00(E)	$2p\ ^2P - 2p^2\ ^2S$	20.380		7.10-02	
608.39	$2p\ ^2P - 2p^2\ ^2S$	20.380	1.80+09	1.00-01	0.5-0.5
608.00(E,T)	$3p\ ^2P^o - (^4P^o)3p\ ^2S$			5.07-02	
608.00(E)	$2p^3\ ^2D^o - 3d\ ^2D$			4.00-05	
602.00(T)	$3d\ ^2D - 7p\ ^2P^o$			8.00-03	
596.00(T)	$2p^3\ ^2P - (^3P^o)3p\ ^2P$			1.00-04	
592.00(T)	$2p^2\ ^2D - 2p^3\ ^2P$			1.05-01	
586.00(T)	$2p\ ^2P - 2p^2\ ^2S$			7.10-02	
563.00(T)	$3p\ ^2P^o - 6s\ ^2S$			1.30-03	
561.00(E)	$2p^3\ ^2P^o - (^3P^o)3p\ ^2P$			1.00-04	
555.26	$2p\ ^2P^o - 2p^2\ ^2P$	22.380	2.80+09	6.40-02	1.5-0.5
554.51	$2p\ ^2P^o - 2p^2\ ^2P$	22.410	6.20+09	3.10-01	1.5-1.5
554.07	$2p\ ^2P^o - 2p^2\ ^2P$	22.380	5.50+09	2.50-01	0.5-0.5
554.00(E)	$2p\ ^2P - 2p^2\ ^2P$	22.380		3.42-01	
553.33	$2p\ ^2P^o - 2p^2\ ^2P$	22.410	1.40+09	1.30-01	0.5-1.5
546.00(T)	$3p\ ^2P^o - 6d\ ^2D$			3.95-02	
546.00(T)	$2p\ ^2P - 2p^2\ ^2P$			3.42-01	
543.00(E)	$3p\ ^2P^o - 6d\ ^2D$			3.95-02	
542.00(T)	$2p^3\ ^2P^o - (^3P^o)5p\ ^2D$			1.17-02	
542.00(T)	$3p\ ^2P^o - (^3P^o)4p\ ^2P$			1.00-04	
540.00(E)	$3p\ ^2P^o - (^1P^o)4p\ ^2P$			1.00-04	
537.00(T)	$2p^3\ ^2P^o - 4s\ ^2S$			6.00-04	
531.00(T)	$3s\ ^2S - 5p\ ^2P^o$			2.58-02	
518.00(T)	$3p\ ^2P^o - 7s\ ^2S$			2.30-03	
516.00(E)	$2p^3\ ^2P^o - (^1P^o)3p\ ^2D$			1.17-02	
515.00(T)	$3p\ ^2P^o - (^3P^o)4p\ ^2D$			2.40-03	
514.00(E)	$3p\ ^2P^o - (^3P^o)4p\ ^2D$			2.40-03	
513.00(T)	$2p^3\ ^2P^o - (^1P^o)3p\ ^2S$			1.04-02	
508.00(T)	$3p\ ^2P^o - 7d\ ^2D$			2.52-02	
508.00(E)	$2p^3\ ^2P^o - 4s\ ^2S$			6.00-04	
501.00(E)	$3s\ ^2P^o - (^3P^o)4p\ ^2S$			1.30-03	

ION		OXYGEN O IV			
λ(Å)	Transition	E_k (eV)	A_{ki} (s^{-1})	f_{ik}	J-J
500.00(E)	$3p\ ^2P^o - (^1P^o)4p\ ^2S$			1.30-03	
492.00(T)	$3p\ ^2P^o - 8s\ ^2S$			6.00-04	
491.00(E)	$2p^2\ ^2P^o - (^1P^o)3p\ ^2S$			1.04-02	
490.00(E)	$3p\ ^2P^o - (^1P^o)3s\ ^2P$			1.50-03	
488.00(T)	$2p^2\ ^2P - 3p\ ^2P^o$				
488.00(T)	$2p^2\ ^2P - 3p\ ^2P^o$			8.00-05	
487.00(T)	$3p\ ^2P^o - 8d\ ^2D$			1.42-02	
487.00(T)	$3p\ ^2P^o - (^3P)3s\ ^2P$			1.50-03	
486.00(T)	$3p\ ^2P^o - (^3P^o)4d\ ^2D$			9.00-04	
482.00(T)	$2p^2\ ^2D^o - (^1P^o)3p\ ^2P$			8.70-03	
477.00(E)	$2p^2\ ^2P - 3p\ ^2P^o$			8.00-05	
477.00(E)	$2p^2\ ^2P - 3p\ ^2P^o$				
476.00(E)	$3p\ ^2P^o - (^1D)3s\ ^2D$			1.24-02	
474.00(T)	$3p\ ^2P^o - (^1P)3s\ ^2D$			1.24-02	
472.00(T)	$3s\ ^2S - 6p\ ^2P^o$			1.24-02	
472.00(E)	$2p^2\ ^2D^o - (^3P^o)3p\ ^2P$	57.930		8.70-03	
464.00(T)	$3s\ ^2S - (^3P^o)4s\ ^2P^o$			1.80-03	
463.00(T)	$2p^2\ ^2S - 3p\ ^2P^o$			1.11-02	
463.00(T)	$2p^2\ ^2S - 3p\ ^2P^o$			1.10-02	
462.00(E)	$3s\ ^2S - (^3P^o)4s\ ^2P^o$			1.80-03	
447.00(T)	$2p^2\ ^2D^o - (^1P^o)3p\ ^2D$			4.10-03	
446.00(E)	$3s\ ^2S - (^1P^o)3d\ ^2P^o$			3.00-09	
445.00(T)	$3s\ ^2S - (^1P^o)3d\ ^2P^o$			3.00-09	
443.00(E)	$2p^2\ ^2S - 3p\ ^2P^o$	48.380		1.11-02	
443.00(E)	$2p^2\ ^2S - 3p\ ^2P^o$	48.370		1.10-02	
439.00(E)	$2p^2\ ^2D^o - (^3P^o)3p\ ^2D$			4.10-03	
438.00(T)	$3s\ ^2S - 7p\ ^2P^o$			9.80-03	
422.00(T)	$3p\ ^2P^o - (^3P^o)5p\ ^2P$			3.00-04	
420.00(E)	$3p\ ^2P^o - (^3P^o)5p\ ^2P$			3.00-04	
417.00(T)	$2p^2\ ^2P^o - 5s\ ^2S$			3.00-04	
413.00(E)	$3p\ ^2P^o - (^3P)3d\ ^2P$			4.00-05	
412.00(T)	$3p\ ^2P^o - (^3P)3d\ ^2P$			4.00-05	
411.00(T)	$2p^3\ ^4S^o - (^3P^o)3p\ ^4P$			7.00-05	
404.00(E)	$2p^3\ ^4S^o - (^1P^o)3p\ ^4P$			7.00-05	
402.00(T)	$2p^2\ ^2P^o - (^1P^o)3p\ ^2D$			4.00-06	
399.00(T)	$2p^2\ ^2P^o - (^1P^o)3p\ ^2P$			6.50-03	
399.00(E)	$2p^2\ ^2P^o - 5s\ ^2S$			3.00-04	
399.00(T)	$2p^2\ ^2D^o - 4d\ ^2D$			1.00-04	
392.00(E)	$2p^2\ ^2D^o - 4d\ ^2D$			1.00-04	
391.00(T)	$2p^3\ ^2P^o - (^1P^o)3p\ ^2S$			1.80-03	
387.00(E)	$2p^2\ ^4P^o - (^3P^o)3p\ ^2D$			4.00-06	
384.00(T)	$2p^2\ ^2D - 3p\ ^2P^o$			6.00-03	
384.00(T)	$2p^2\ ^2D - 3p\ ^2P^o$	48.370		5.90-03	
383.00(E)	$2p^3\ ^2P^o - (^1P^o)3p\ ^2P$			6.60-03	
382.00(T)	$3p\ ^2P^o - (^3P^o)6p\ ^2P$			2.00-04	
380.00(E)	$2p^2\ ^2D - 3p\ ^2P^o$	48.370		5.90-03	
380.00(E)	$2p^2\ ^2D - 3p\ ^2P^o$	48.370		6.00-03	
376.00(E)	$2p^3\ ^2P^o - (^1P^o)3p\ ^2S$			1.80-03	
375.00(T)	$3p\ ^2P^o - (^1P^o)4p\ ^2P$			1.00-04	
373.00(T)	$2p^2\ ^2P^o - (^1P^o)3s\ ^2P^o$			9.90-03	

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λ (Å)	Transition	E_k (eV)	A_{ki} (s^{-1})	f_{ik}	J-J
367.00(E)	$2p^1\,^2P - (^1P^o)3s\,^2P^o$	56.170		9.90-03	
363.00(T)	$2p^3\,^2P^o - (^3P^o)4p\,^2P$			2.42-02	
361.00(T)	$3p\,^1P - (^3P^o)7p\,^2P$			5.00-04	
358.00(T)	$2p^2\,^2S - (^3P^o)3s\,^4P^o$	56.140		8.59-02	
353.00(T)	$2p^3\,^2P^o - (^3P^o)4p\,^2D$			2.70-03	
349.00(E)	$2p^3\,^2P^o - (^3P^o)4p\,^2P$			2.42-02	
347.00(T)	$2p^3\,^2D^o - (^1P^o)3p\,^2D$			2.10-03	
346.00(E)	$2p^2\,^2S - (^3P^o)3s\,^2P^o$	56.170		8.59-02	
345.00(T)	$2p^3\,^2D^o - (^1P^o)3p\,^2P$			1.15-02	
344.00(T)	$2p^3\,^2P^o - (^3P^o)4p\,^2S$			1.50-03	
343.00(T)	$2p^3\,^2D^o - 5d\,^2D$			7.06-05	
342.00(E)	$2p^3\,^4D^o - (^4P^o)3p\,^2D$			2.10-03	
339.00(T)	$2p^3\,^2P^o - 8d\,^2D$			1.40-03	
339.00(E)	$2p^3\,^2D^o - (^4P^o)3p\,^2P$	68.160		1.15-02	
338.00(E)	$2p^3\,^4P^o - (^3P^o)4p\,^2D$			2.70-03	
337.00(T)	$2p^3\,^2P^o - (^3P^o)4f\,^2D$			1.42-02	
337.00(T)	$2p^1\,^2P^o - (^1P)3s\,^2P$			5.66-02	
337.00(E)	$2p^3\,^4D^o - 5d\,^2D$			7.00-05	
332.00(E)	$2p^3\,^2P^o - (^3P^o)4p\,^2S$			1.50-03	
331.00(T)	$2p^3\,^2P^o - (^1D)5s\,^2D$			3.47-02	
327.00(E)	$2p^3\,^2P^o - (^1P)3s\,^2P$			5.66-02	
321.00(E)	$2p^3\,^2P^o - (^1D)3s\,^2D$	74.400		3.47-02	
318.00(T)	$2p^1\,^2D^o - 6d\,^2D$			2.00-05	
318.00(T)	$2p^2\,^2P - 4p\,^2P$			1.00-03	
317.00(T)	$2p^3\,^2D^o - (^3P^o)4p\,^2P$			1.65-02	
313.00(E)	$2p^3\,^2D^o - 6d\,^2D$			2.00-05	
312.00(E)	$2p^3\,^2D^o - (^3P^o)4p\,^2P$			1.66-02	
309.00(T)	$2p^1\,^2D - (^3P^o)3s\,^2P^o$	56.140		4.15-02	
308.00(T)	$2p^3\,^2D^o - (^3P^o)4p\,^2D$			1.16-02	
307.00(T)	$2p^2\,^2S - 4p\,^2P^o$			5.00-04	
307.00(E)	$2p^1\,^2D - (^3P^o)3s\,^2P^o$	56.140		4.15-02	
305.00(T)	$2p^3\,^2D^o - 7d\,^2D$			5.00-04	
304.00(T)	$2p^3\,^2P^o - (^3P^o)5p\,^2P$			1.06-02	
303.00(E)	$2p^3\,^2D^o - (^3P^o)4p\,^2D$			1.16-02	
303.00(T)	$2p^2\,^2P - (^3P^o)3d\,^2P^o$			1.04-01	
301.00(T)	$2p^1\,^2P - (^1P^o)3s\,^2P^o$			2.23-02	
300.00(T)	$2p^3\,^2P^o - (^3P)3d\,^2P$			1.34-01	
300.00(E)	$2p^1\,^2P - (^3P^o)3d\,^2P^o$	63.750		1.04-01	
298.00(T)	$2p^3\,^2D^o - 8d\,^2D$			5.00-05	
298.00(T)	$2p^3\,^2D^o - (^3P)3s\,^2P$			3.09-02	
297.00(T)	$2p^3\,^2D^o - (^3P^o)4f\,^2D$	73.680		3.60-03	
296.00(E)	$2p^2\,^2P - (^1P^o)3s\,^2P^o$			2.23-02	
296.00(E)	$2p^3\,^2P^o - (^3P^o)5p\,^2P$			1.06-02	
295.00(E)	$2p^3\,^2D^o - (^3P)3s\,^4P$			3.09-02	
293.00(T)	$2p^3\,^2S - (^3P^o)3d\,^4P^o$			7.43-01	
293.00(T)	$2p^3\,^2D^o - (^1D)3s\,^2D$			5.59-02	
291.00(E)	$2p^3\,^4P^o - (^3P)3d\,^2P$			1.34-01	
291.00(T)	$2p^2\,^2S - (^1P^o)3s\,^2P^o$			1.40-02	
290.00(T)	$2p^3\,^2D - (^1D)3s\,^2D$	74.400		5.59-02	
286.00(T)	$2p^2\,^2S - (^3P^o)3d\,^2P^o$	63.750		7.43-01	

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λ (Å)	Transition	E_k (eV)	A_{ki} (s^{-1})	f_{ik}	J - J
283.00(T)	$2p^3\,^2P^o - (^3P^e)6p\,^2P$	?.???	?.??+??	3.30-03	?.?-?.?
282.00(E)	$2p^2\,^2S - (^1P^e)3s\,^2P^o$	64.310	?.??+??	1.40-02	?.?-?.?
281.80(T)	$2p\,^2P - 3s\,^2S$	?.???	?.??+??	3.00-02	?.?-?.?
279.94	$2p\,^2P^o - 2s\,^2S$	44.340	8.50+09	5.00-02	1.5-0.5
279.63	$2p\,^2P^o - 3s\,^2S$	44.340	4.30+09	5.00-02	0.5-0.5
279.00(T)	$2p^3\,^2P - (^4P^e)4p\,^2P$	?.???	?.??+??	5.22-02	?.?-?.?
279.00(E)	$2p\,^2P - 3s\,^2S$	44.340	?.??+??	3.00-02	?.?-?.?
277.00(T)	$2p^2\,^2P - 5p\,^2P^o$	?.???	?.??+??	1.80-03	?.?-?.?
275.00(T)	$2p^2\,^4P - 3s\,^4P^o$	54.390	?.??+??	1.12-01	?.?-?.?
272.80(T)	$2p^3\,^2P^o - (^3P^e)7p\,^2P$	?.???	?.??+??	1.61-02	?.?-?.?
272.80(E)	$2p^2\,^4P - 3s\,^4P$	54.390	?.??+??	1.12-01	?.?-?.?
270.00(T)	$2p^2\,^2D - 4p\,^2P^o$	?.???	?.??+??	5.00-04	?.?-?.?
267.00(T)	$2p^2\,^2S - 5p\,^2P^o$	?.???	?.??+??	2.00-05	?.?-?.?
260.00(T)	$2p^2\,^2P - 6p\,^2P^o$	?.???	?.??+??	1.80-03	?.?-?.?
259.00(T)	$2p^2\,^2D - (^3P^e)3d\,^2P^o$	65.750	?.??+??	1.37-02	?.?-?.?
258.00(T)	$2p^2\,^2P - (^3P^e)4s\,^2P^o$	?.???	?.??+??	9.00-06	?.?-?.?
258.00(T)	$2p^2\,^2D - (^3P^e)5s\,^2P^o$	?.???	?.??+??	1.26-02	?.?-?.?
258.00(E)	$2p^2\,^2D - (^3P^e)3d\,^2P^o$	65.770	?.??+??	1.37-02	?.?-?.?
256.00(T)	$2p^3\,^2D^o - (^3P^e)6p\,^2P$	?.???	?.??+??	2.00-05	?.?-?.?
255.00(E)	$2p^2\,^2D - 5p\,^2P^o$	?.???	?.??+??	1.00-04	?.?-?.?
255.00(E)	$2p^2\,^2D - (^1P^e)3s\,^2P^o$	64.310	?.??+??	1.26-02	?.?-?.?
254.00(E)	$2p^2\,^2P - (^3P^e)4s\,^2P^o$	?.???	?.??+??	9.00-06	?.?-?.?
253.00(T)	$2p^2\,^2S - 6p\,^2P^o$	?.???	?.??+??	1.48-02	?.?-?.?
252.00(T)	$2p^2\,^2P - (^3P^e)3d\,^2P^o$	72.120	?.??+??	1.49-01	?.?-?.?
251.00(T)	$2p^3\,^2D^o - (^4P^e)4p\,^2P$	?.???	?.??+??	1.32-02	?.?-?.?
250.00(T)	$2p^2\,^2P - 7p\,^2P^o$	?.???	?.??+??	2.72-02	?.?-?.?
250.00(T)	$2p^2\,^2S - (^3P^e)4s\,^2P^o$	?.???	?.??+??	1.36-02	?.?-?.?
249.00(E)	$2p^2\,^2P - (^3P^e)3d\,^2P^o$	72.120	?.??+??	1.49-01	?.?-?.?
245.00(T)	$2p^3\,^2D^o - (^3P^e)7p\,^2P$	?.???	?.??+??	2.00-03	?.?-?.?
245.00(T)	$2p^2\,^2S - (^3P^e)3d\,^2P^o$	?.???	?.??+??	1.92-01	?.?-?.?
244.00(E)	$2p^2\,^2S - (^3P^e)4s\,^2P^o$	?.???	?.??+??	1.36-02	?.?-?.?
243.00(T)	$2p^2\,^2S - 7p\,^2P^o$	?.???	?.??+??	4.84-02	?.?-?.?
240.00(E)	$2p^2\,^2S - (^1P^e)3d\,^2P^o$	?.???	?.??+??	1.92-01	?.?-?.?
240.00(T)	$2p^2\,^2D - 5p\,^2P^o$	?.???	?.??+??	1.00-04	?.?-?.?
239.00(E,T)	$2p\,^2P - 3d\,^2D$	62.010	?.??+??	5.05-01	?.?-?.?
238.58	$2p\,^2P^o - 3d\,^2D$	52.010	5.90+09	5.00-02	1.5-1.5
238.57	$2p\,^2P^o - 3d\,^2D$	52.010	3.50+10	4.50-01	1.5-2.5
238.36	$2p\,^2P^o - 3d\,^2D$	52.020	3.00+10	5.00-01	0.5-1.5
234.00(E,T)	$2p^2\,^4P - 3d\,^4D$	61.940	?.??+??	7.29-01	?.?-?.?
232.00(T)	$2p^2\,^4P - 3d\,^4P$	62.460	?.??+??	2.43-01	?.?-?.?
231.00(E)	$2p^2\,^4P - 3d\,^4P$	62.480	?.??+??	2.43-01	?.?-?.?
227.00(T)	$2p^2\,^2D - 6p\,^2P^o$	?.???	?.??+??	3.50-03	?.?-?.?
226.00(T)	$2p^2\,^2D - (^3P^e)4s\,^2P^o$	?.???	?.??+??	6.10-03	?.?-?.?
224.00(E)	$2p^2\,^2D - (^3P^e)4s\,^2P^o$	71.120	?.??+??	6.10-03	?.?-?.?
221.00(T)	$2p^2\,^2D - (^4P^e)3d\,^2P^o$	?.???	?.??+??	1.80-03	?.?-?.?
220.00(E)	$2p^2\,^2D - (^4P^e)3d\,^2P^o$	?.???	?.??+??	1.80-03	?.?-?.?
219.00(T)	$2p^2\,^2D - 7p\,^2P^o$	?.???	?.??+??	5.00-04	?.?-?.?
215.00(T)	$2p\,^2P^o - (^3P^e)3p\,^2P$	57.940	?.??+??	7.42-02	?.?-?.?
214.00(E)	$2p\,^2P^o - (^3P^e)3p\,^2P$	57.930	?.??+??	7.42-02	?.?-?.?
214.00(E)	$2p\,^2P^o - (^1P^e)3p\,^2S$	?.???	?.??+??	2.18-02	?.?-?.?

ION OXYGEN O IV

λ (Å)	Transition	E_k (eV)	A_{ki} (s^{-1})	f_{ik}	J-J
208.00(E,T)	$2p\ ^2P - (^1P)3p\ ^2D$	59.840	?.???+??	1.26-01	?.?-?.?
207.00(T)	$2p\ ^2P^o - 4s\ ^2S$	?.???	?.???+??	2.00-03	?.?-?.?
206.00(E)	$2p\ ^2P^o - 4s\ ^2S$	60.230	?.???+??	2.00-03	?.?-?.?
203.00(T)	$2p\ ^2P^o - (^3P^o)3p\ ^2S$	61.110	?.???+??	2.18-02	?.?-?.?
202.00(T)	$2p^2\ ^4P - (^4P^o)4s\ ^4P^o$	70.510	?.???+??	2.18-02	?.?-?.?
201.00(E)	$2p^2\ ^4P - (^3P^o)4s\ ^4P^o$	70.500	?.???+??	2.18-02	?.?-?.?
197.00(T)	$2p\ ^2P^o - 4d\ ^2D$	?.???	?.???+??	1.14-01	?.?-?.?
196.00(E)	$2p\ ^2P^o - 4d\ ^2D$	63.300	?.???+??	1.14-01	?.?-?.?
193.00(T)	$2p^2\ ^4P^o - (^3P^o)4d\ ^4D^o$	73.370	?.???+??	2.09-01	?.?-?.?
192.00(E,T)	$2p^2\ ^4P - (^3P^o)4d\ ^4P^o$	73.520	?.???+??	7.11-02	?.?-?.?
192.00(E)	$2p^2\ ^4P - (^3P^o)4d\ ^4D^o$	73.370	?.???+??	2.09-01	?.?-?.?
188.00(E,T)	$2p^2\ ^4P - (^3P^o)3p\ ^4D^o$	74.750	?.???+??	9.10-03	?.?-?.?
187.00(E,T)	$2p^2\ ^4P - (^3P^o)3p\ ^4P^o$	75.180	?.???+??	1.70-02	?.?-?.?
186.00(T)	$2p\ ^1P^o - 5s\ ^2S$	66.870	?.???+??	5.40-03	?.?-?.?
185.00(E)	$2p\ ^2P^o - 5s\ ^2S$	?.???	?.???+??	5.40-03	?.?-?.?
183.00(E,T)	$2p^2\ ^4P - (^3P)3p\ ^4S^o$	76.440	?.???+??	8.00-03	?.?-?.?
183.00(E,T)	$2p^2\ ^1P^o - (^1P^o)3p\ ^2D$	67.860	?.???+??	1.53-02	?.?-?.?
182.00(E,T)	$2p\ ^2P^o - (^1P^o)3p\ ^2P$	68.170	?.???+??	1.51-02	?.?-?.?
182.00(T)	$2p\ ^2P^o - 5d\ ^2D$	68.440	?.???+??	5.10-02	?.?-?.?
181.00(E)	$2p\ ^2P^o - 5d\ ^2D$	68.440	?.???+??	5.10-02	?.?-?.?
181.00(T)	$2p\ ^2P^o - (^3P^o)3p\ ^2S$	?.???	?.???+??	6.40-03	?.?-?.?
180.00(E)	$2p\ ^2P^o - (^3P^o)3p\ ^2S$	68.740	?.???+??	6.40-03	?.?-?.?
177.00(T)	$2p\ ^2P^o - 6s\ ^2S$	?.???	?.???+??	1.00-04	?.?-?.?
175.00(T)	$2p\ ^2P^o - (^3P^o)4p\ ^2P$	?.???	?.???+??	1.95-02	?.?-?.?
175.00(T)	$2p\ ^2P^o - 6d\ ^2D$	71.210	?.???+??	2.93-02	?.?-?.?
174.00(E)	$2p\ ^2P^o - 6d\ ^2D$	71.210	?.???+??	2.93-02	?.?-?.?
174.00(E)	$2p\ ^2P^o - (^3P^o)4p\ ^2P$	71.310	?.???+??	1.95-02	?.?-?.?
172.00(T)	$2p\ ^2P^o - 7s\ ^2S$	?.???	?.???+??	1.00-04	?.?-?.?
172.00(T)	$2p\ ^2P^o - (^3P^o)4p\ ^2D$	72.470	?.???+??	3.65-02	?.?-?.?
171.00(T)	$2p\ ^2P^o - 7d\ ^2D$	?.???	?.???+??	1.08-02	?.?-?.?

ION OXYGEN O V

λ (Å)	Transition	E_k (eV)	A_{ki} (s^{-1})	f_{ik}	J - J
7458.00	$4s\ ^3S - 4p\ ^3P^o$	81.260	2.87+07	7.15-01	1.0-1.0
6909.00	$3p\ ^3P - 3d\ ^3D^o$	87.320	2.00+05	8.00-04	2.0-1.0
6878.00	$3p\ ^3P - 3d\ ^3D^o$	87.330	1.83+06	1.30-02	2.0-2.0
6850.00	$3p\ ^3P - 3d\ ^3D^o$	87.340	7.50+06	7.30-02	2.0-3.0
6819.00	$3p\ ^3P - 3d\ ^3D^o$	87.320	3.13+06	2.18-02	1.0-1.0
6790.00	$3p\ ^3P - 3d\ ^3D^o$	87.330	5.70+06	6.60-02	1.0-2.0
6767.00	$3p\ ^3P - 3d\ ^3D^o$	87.320	4.30+06	8.80-02	0.0-1.0
6329.00	$3p\ ^1D - 3d\ ^1F^o$	88.390	1.36+07	1.14-01	2.0-3.0
5608.00	$3p\ ^3P^o - 3d\ ^3D$	74.500	4.80+05	1.30-03	2.0-1.0
5608.00	$3p\ ^3P^o - 3d\ ^1D$	0.000	4.80+05	0.00+00	2.0-1.0
5606.00	$3p\ ^3P^o - 3d\ ^3D$	74.500	4.37+06	2.06-02	2.0-2.0
5606.00	$3p\ ^3P^o - 3d\ ^1D$	0.000	4.35+06	0.00+00	2.0-2.0
5600.00	$3p\ ^3P^o - 3d\ ^3D$	74.500	1.75+07	1.15-01	2.0-3.0
5600.00	$3p\ ^3P^o - 3d\ ^1D$	0.000	1.74+07	0.00+00	2.0-3.0
5584.00	$3p\ ^1P^o - 3d\ ^1D$	74.500	7.37+06	3.45-02	1.0-1.0
5584.00	$3p\ ^3P^o - 3d\ ^3D$	0.000	7.32+06	0.00+00	1.0-1.0
5582.00	$3p\ ^1P^o - 3d\ ^1D$	74.500	1.33+07	1.03-01	1.0-2.0
5582.00	$3p\ ^1P^o - 3d\ ^3D$	0.000	1.32+07	0.00+00	1.0-2.0
5573.00	$3p\ ^3P^o - 3d\ ^1D$	74.500	9.87+06	1.38-01	0.0-1.0
5573.00	$3p\ ^3P^o - 3d\ ^3D$	0.000	9.85+06	0.00+00	0.0-1.0
5475.00	$3p\ ^3P - 3d\ ^3P^o$	87.790	6.40+07	2.85-01	2.0-2.0
5432.00	$3p\ ^3P - 3d\ ^3P^o$	87.810	3.61+07	9.60-02	2.0-1.0
5417.00	$3p\ ^3P - 3d\ ^1P^o$	87.790	2.18+07	1.60-01	1.0-2.0
5376.00	$3p\ ^1P - 3d\ ^1P^o$	87.810	2.23+07	9.70-02	1.0-1.0
5352.00	$3p\ ^3P - 3d\ ^3P^o$	87.820	9.10+07	1.30-01	1.0-0.0
5343.00	$3p\ ^3P - 3d\ ^3P^o$	87.810	3.04+07	3.90-01	0.0-1.0
5114.00	$3s\ ^1S - 3p\ ^1P^o$	0.000	1.62+07	0.00+00	0.0-1.0
4769.00	$3s\ ^1S - 3p\ ^3P$	0.000	3.47+04	0.00+00	0.0-1.0
4554.98	$3p\ ^1P - 3d\ ^1D^o$	86.120	2.33+07	1.21-01	1.0-2.0
4522.00	$3p\ ^1D - 3d\ ^1P^o$	89.170	1.10+06	2.00-03	2.0-1.0
4211.00	$3s\ ^3P^o - 3p\ ^3D$	83.970	1.27+06	2.02-03	2.0-1.0
4179.00	$3s\ ^3P^o - 3p\ ^1D$	83.990	1.17+07	3.05-02	2.0-2.0
4153.76	$3p\ ^3S - 3d\ ^1P^o$	87.790	2.57+07	1.11-01	1.0-2.0
4151.00	$3s\ ^3P^o - 3p\ ^1D$	83.970	1.98+07	5.10-02	1.0-1.0
4135.90	$3p\ ^3S - 3d\ ^3P^o$	87.810	2.61+07	6.70-02	1.0-1.0
4123.90	$3s\ ^3P^o - 3p\ ^3D$	84.040	4.87+07	1.74-01	2.0-3.0
4123.00	$3s\ ^3P^o - 3p\ ^1D$	84.000	2.70+07	2.06-01	0.0-1.0
4121.70	$3p\ ^1S - 3d\ ^1P^o$	87.820	2.64+07	2.24-02	1.0-0.0
4120.00	$3s\ ^3P^o - 3p\ ^1D$	84.000	8.65+07	1.56-01	1.0-2.0
3762.00	$3p\ ^1D - 3d\ ^1D^o$	87.330	2.35+06	3.50-03	3.0-2.0
3747.00	$3p\ ^1D - 3d\ ^1D^o$	87.340	1.36+07	2.86-02	3.0-3.0
3726.00	$3p\ ^1D - 3d\ ^1D^o$	87.320	5.88+06	4.80-03	2.0-1.0
3717.00	$3p\ ^1D - 3d\ ^1D^o$	87.330	1.09+07	2.26-02	2.0-2.0
3703.00	$3p\ ^1D - 3d\ ^1D^o$	87.340	1.76+06	5.10-03	2.0-3.0
3701.00	$3p\ ^1D - 3d\ ^1D^o$	87.320	1.19+07	2.44-02	1.0-1.0
3692.00	$3p\ ^1D - 3d\ ^1D^o$	87.320	2.39+06	8.10-03	1.0-2.0
3298.00	$3p\ ^1D - 3d\ ^1P^o$	87.790	2.16+06	2.50-03	3.0-2.0
3279.67	$3s\ ^3P^o - 3p\ ^1S$	84.820	5.50+07	5.30-02	2.0-1.0
3264.00	$3p\ ^1S - 3d\ ^1P^o$	87.790	3.90+04	6.00-04	2.0-2.0
3249.00	$3p\ ^1D - 3d\ ^1P^o$	87.810	2.01+06	1.90-03	2.0-1.0

ION	OXYGEN O V				
λ(Å)	Transition	E_k (eV)	A_{ki} (s^{-1})	f_{ik}	J - J
3245.00	$3p\ ^1L - 3d\ ^1P^o$	87.790	2.00+04	[illegible]	1.0-2.0
3239.00	$3s\ ^3P^o - 3p\ ^3S$	84.820	3.42+07	5.40-02	1.0-1.0
3230.00	$3p\ ^3D - 3d\ ^3P^o$	87.810	6.80+05	1.00-03	1.0-1.0
3222. 0	$3p\ ^3D - 3d\ ^3P^o$	87.820	2.76+06	1.40-03	1.0-0.0
3222.00	$3p\ ^3P^o - 3p\ ^3S$	84.820	1.16+07	5.40-02	0.0-1.0
3144.68	$3p\ ^3P^o - 3d\ ^3D$	75.950	1.05+08	2.58-01	1.0-2.0
3144.68	$3p\ ^3P^o - 3d\ ^3D$	[illegible]	1.12+08	[illegible]	1.0-2.0
3058.68	$3s\ ^3P^o - 3p\ ^3D$	86.430	1.30+08	3.05-01	1.0-2.0
1371.29	$2p\ ^3P^o - 2p^2\ ^1D$	28.730	6.70+08	3.20-01	1.0-2.0
1371.29	$2p\ ^3P^o - 2p^2\ ^1D$	[illegible]	3.44+08	[illegible]	1.0-2.0
1311.80	$2p\ ^3P - 2p\ ^3P$	[illegible]	1.00-01	[illegible]	2.0-1.0
1306.50	$2p\ ^3P - 2p\ ^3P$	[illegible]	6.45-02	[illegible]	1.0-1.0
1304.20	$2p\ ^3P - 2p\ ^3P$	[illegible]	3.65-02	[illegible]	0.0-1.0
774.52	$2p\ ^3P^o - 2p^2\ ^3S$	35.690	2.10+09	4.20-02	1.0-0.0
762.00	$2p\ ^3P^o - 2p^2\ ^3P$	26.610	8.60+08	4.50-02	2.0-1.0
762.00	$2p\ ^3P^o - 2p^2\ ^3P$	[illegible]	9.72+08	[illegible]	2.0-1.0
761.13	$2p\ ^3P^o - 2p^2\ ^3P$	26.490	2.10+09	6.00-02	1.0-0.0
761.13	$2p\ ^3P^o - 2p^2\ ^3P$	[illegible]	2.34+09	[illegible]	1.0-0.0
760.45	$2p\ ^3P^o - 2p^2\ ^3P$	26.540	1.40+09	1.48-01	2.0-2.0
760.45	$2p\ ^3P^o - 2p^2\ ^3P$	[illegible]	1.76+09	[illegible]	2.0-2.0
760.23	$2p\ ^3P^o - 2p^2\ ^3P$	26.510	5.20+08	4.50-02	1.0-1.0
760.23	$2p\ ^3P^o - 2p^2\ ^3P$	[illegible]	5.88+08	[illegible]	1.0-1.0
759.44	$2p\ ^3P^o - 2p^2\ ^3P$	26.510	6.90+08	1.80-01	0.0-1.0
758.68	$2p\ ^3P^o - 2p^2\ ^3P$	26.540	5.20+08	7.50-02	1.0-2.0
758.68	$2p\ ^3P^o - 2p^2\ ^3P$	[illegible]	5.92+08	[illegible]	1.0-2.0
629.73	$2s^2\ ^1S - 2p\ ^1P^o$	19.690	3.00+09	5.30-01	0.0-1.0
629.73	$2s^2\ ^1S - 2p\ ^1P^o$	[illegible]	3.32+09	[illegible]	0.0-1.0
248.46	$2p\ ^1P^o - 3s\ ^1S$	69.590	1.37+10	4.24-02	1.0-0.0
248.46	$2p\ ^1P^o - 3s\ ^1S$	[illegible]	7.9 +09	[illegible]	1.0-0.0
224.68	$2p\ ^1P^o - 3d\ ^1D$	[illegible]	1.92+05	0.00+00	1.0-1.0
220.35	$2p\ ^1P^o - 3d\ ^1D$	75.960	4.58+10	5.60-01	1.0-2.0
220.35	$2p\ ^1P^o - 3d\ ^1D$	[illegible]	4.58+10	[illegible]	1.0-2.0
215.25	$2p\ ^1P^o - 3s\ ^1S$	[illegible]	1.03+10	[illegible]	2.0-1.0
215.25	$2p\ ^1P^o - 3s\ ^1S$	67.830	1.17+10	4.88-02	2.0-1.0
215.13	$2p\ ^1P^o - 3s\ ^1S$	67.830	2.11+10	4.88-02	4.0-1.0
215.10	$2p\ ^1P^o - 3s\ ^1S$	67.850	7.10+09	4.90-02	1.0-1.0
215.10	$2p\ ^1P^o - 3s\ ^1S$	[illegible]	6.14+09	[illegible]	1.0-1.0
215.03	$2p\ ^1P^o - 3s\ ^1S$	67.830	2.35+09	4.89-02	0.0-1.0
215.03	$2p\ ^1P^o - 3s\ ^1S$	[illegible]	2.03+09	[illegible]	0.0-1.0
192.92	$2p\ ^3P^o - 3d\ ^3D$	74.510	1.90+09	6.40-03	3.0-1.0
192.92	$2p\ ^3P^o - 3d\ ^3D$	[illegible]	1.85+10	[illegible]	2.0-1.0
192.91	$2p\ ^3P^o - 3d\ ^3D$	74.510	1.71+10	9.50-02	2.0-2.0
192.91	$2p\ ^3P^o - 3d\ ^3D$	[illegible]	5.00+10	[illegible]	1.0-2.0
192.91	$2p\ ^3P^o - 3d\ ^3D$	74.500	6.80+10	6.30-01	2.0-3.0
192.81	$2p\ ^3P^o - 3d\ ^3D$	[illegible]	6.67+10	[illegible]	2.0-3.0
192.80	$2p\ ^3P^o - 3d\ ^3D$	74.500	5.10+10	4.78-01	1.0-2.0
192.80	$2p\ ^3P^o - 3d\ ^3D$	74.510	2.86+10	1.59-01	1.0-1.0
192.50	$2p\ ^3P^o - 3d\ ^3D$	[illegible]	2.78+10	[illegible]	1.0-1.0
192.75	$2p\ ^3P^o - 3d\ ^3D$	74.500	3.80+10	6.40-01	0.0-1.0
192.75	$2p\ ^3P^o - 3d\ ^3D$	[illegible]	3.70+10	[illegible]	0.0-1.0

ION OXYGEN O V

λ(Å)	Transition	E_k (eV)	A_{ki} (s^{-1})	f_{ik}	J - J
172.17	$2s^2\,{}^1S - 3p\,{}^1P^o$	72.220	4.50+10	5.90-01	0.0-1.0
172.17	$2s^2\,{}^1S - 3p\,{}^1P^o$	0.000	2.95+10	0.00+00	0.0-1.0
172.15	$2s^2\,{}^1S - 3p\,{}^1P^o$	0.000	5.14+07	0.00+00	0.0-1.0
73.13	$2p^2\,{}^3P - 2p^2\,{}^3P$	0.001	6.26+08	0.00+00	0.0-1.0
32.65	$2p^2\,{}^3P - 2p^2\,{}^3P$	0.003	2.26+08	0.00+00	1.0-2.0
0.11	$2s^2\,{}^1S - 2p^2\,{}^3P$	0.000	1.10+03	0.00+00	0.0-1.0
0.00	$2p^2\,{}^1D - 2p^2\,{}^3P$	0.000	2.22+03	0.00+00	2.0-1.0
0.00	$2p^2\,{}^1D - 2p^2\,{}^3P$	0.001	1.87+08	0.00+00	2.0-1.0
0.00	$2p^2\,{}^3P - 2p^2\,{}^3P$	0.000	1.20+02	0.00+00	1.0-1.0
0.00	$2p^2\,{}^3P - 2p^2\,{}^3P$	0.000	1.26+05	0.00+00	1.0-2.0
0.00	$2p^2\,{}^3P - 2p^2\,{}^1D$	0.001	1.80+04	0.00+00	1.0-2.0
0.00	$2p^2\,{}^3P - 2p^2\,{}^1D$	0.003	1.84+05	0.00+00	2.0-2.0
0.00	$2p^2\,{}^3P - 2p^2\,{}^1S$	0.000	1.55+04	0.00+00	1.0-0.0
0.00	$2p^2\,{}^3P - 3s\,{}^3S$	0.000	1.42+04	0.00+00	1.0-1.0
0.00	$2p^2\,{}^3P - 3s\,{}^1S$	0.000	1.23+05	0.00+00	1.0-0.0
0.00	$2p^2\,{}^3P - 3p\,{}^1P$	0.000	1.45+03	0.00+00	1.0-1.0
0.00	$2p^2\,{}^3P - 3p\,{}^3P$	0.000	1.63+04	0.00+00	1.0-1.0
0.00	$2p^2\,{}^1D - 3p\,{}^1P$	0.000	1.22+05	0.00+00	2.0-1.0
0.00	$2p^2\,{}^1D - 3p\,{}^3P$	0.000	1.55+09	0.00+00	2.0-1.0
0.00	$2p^2\,{}^1S - 3p\,{}^1P$	0.000	1.46+08	0.00+00	0.0-1.0
0.00	$3s\,{}^1S - 3p\,{}^1P$	0.000	1.40+05	0.00+00	1.0-1.0
0.00	$2p^2\,{}^3P - 3p\,{}^3P$	0.000	1.39+07	0.00+00	0.0-0.0
0.00	$3s\,{}^1S - 3p\,{}^3P$	0.000	1.49+08	0.00+00	1.0-0.0
0.00	$2p^2\,{}^3P - 3p\,{}^3P$	0.000	1.19+07	0.00+00	0.0-1.0
0.00	$2p^2\,{}^3P - 3p\,{}^1P$	0.000	1.59+07	0.00+00	1.0-1.0
0.00	$2p^2\,{}^1D - 3p\,{}^3P$	0.000	1.65+07	0.00+00	2.0-1.0
0.00	$2p^2\,{}^1D - 3p\,{}^3P$	0.000	1.68+07	0.00+00	2.0-1.0
0.00	$2p^2\,{}^1S - 3p\,{}^1P$	0.000	1.44+05	0.00+00	0.0-1.0
0.00	$3s\,{}^1S - 3p\,{}^3P$	0.000	1.49+08	0.00+00	1.0-1.0
0.00	$2p^2\,{}^3P - 3p\,{}^3P$	0.000	1.68+07	0.00+00	1.0-2.0
0.00	$2p^2\,{}^3P - 3p\,{}^1P$	0.000	1.95+07	0.00+00	2.0-2.0
0.00	$2p^2\,{}^1D - 3p\,{}^3P$	0.000	1.43+05	0.00+00	2.0-2.0
0.00	$3s\,{}^1S - 3p\,{}^3P$	0.000	1.51+08	0.00+00	1.0-2.0
0.00	$3p\,{}^1P - 3d\,{}^1D$	0.000	1.59+04	0.00+00	1.0-1.0
0.00	$3p\,{}^3P - 3d\,{}^3D$	0.000	1.31+05	0.00+00	1.0-2.0
0.00	$3p\,{}^1P - 3d\,{}^1D$	0.000	1.05+04	0.00+00	1.0-2.0
0.00	$2p\,{}^1P - 3d\,{}^1D$	0.000	1.11+06	0.00+00	1.0-2.0
0.00	$2p\,{}^1P - 3d\,{}^1D$	0.000	1.30+08	0.00+00	2.0-2.0
0.00	$2p\,{}^3P - 3d\,{}^3D$	0.000	1.84+05	0.00+00	1.0-2.0
0.00	$2p\,{}^3P - 3d\,{}^3D$	0.000	1.21+01	0.00+00	2.0-2.0
0.00	$2p^2\,{}^3P - 2p^2\,{}^3P$	0.000	7.52-05	0.00+00	0.0-1.0
0.00	$2p^2\,{}^1P - 2p^2\,{}^3P$	0.001	3.04-04	0.00+00	1.0-2.0
0.00	$2s^2\,{}^1S - 2p\,{}^3P$	0.000	8.17-02	0.00+00	0.0-2.0
0.00	$2p^2\,{}^3P - 3d\,{}^3D$	0.001	1.67+10	0.00+00	2.0-2.0
0.00	$2s^2\,{}^1S - 2p\,{}^3P^o$	0.000	0.00+00	5.18-01	0.0-0.0
0.00	$2s^2\,{}^1S - 2p\,{}^1P^o$	0.000	0.00+00	8.29-01	0.0-0.0
0.00	$2s^2\,{}^1S - 2p\,{}^3P^o$	0.000	0.00+00	5.16-01	0.0-0.0
0.00	$2p\,{}^3P^o - 2p^2\,{}^1S$	0.000	0.00+00	1.16-01	0.0-0.0
0.00	$2p\,{}^3P^o - 2p^2\,{}^1S$	0.000	0.00+00	1.23-01	0.0-0.0
0.00	$2p\,{}^1P^o - 2p^2\,{}^1S$	0.000	0.00+00	1.16-01	0.0-0.0

ION OXYGEN O V

λ(Å)	Transition	E_k (eV)	A_{ki} (s^{-1})	f_{ik}	J - J
0.00	$2p^4\,{}^3P^o - 2p^3\,{}^1D$	0.000	0.00+00	1.56-01	0.0-0.0
0.00	$2p\,{}^1P^o - 2p^2\,{}^1D$	0.000	0.00+00	1.82-01	0.0-0.0
0.00	$2p\,{}^3P^o - 2p^2\,{}^1D$	0.000	0.00+00	1.88-01	0.0-0.0
0.00	$2p\,{}^3P^o - 2p^2\,{}^3P$	0.000	0.00+00	1.92-01	0.0-0.0
0.00	$2p\,{}^1P^o - 2p^2\,{}^3P$	0.000	0.00+00	2.04-01	0.0-0.0
0.00	$2p\,{}^3P^o - 2p^2\,{}^3P$	0.000	0.00+00	1.96-01	0.0-0.0

ION	OXYGEN O VI				
$\lambda(\text{Å})$	Transition	E_k (eV)	A_{ki} (s^{-1})	f_{ik}	J-J
11892.00	$3p\ ^1P^\circ - 3d\ ^1D$	83.650	1.36+06	4.33-02	1.5-2.5
11744.00	$3p\ ^1P^\circ - 3d\ ^1D$	83.650	1.18+06	4.22-02	0.5-1.5
5602.00	$7p\ ^1P^\circ - 8s\ ^1S$	130.240	1.38+08	2.16-01	1.5-0.5
6602.00	$7p\ ^1P^\circ - 8s\ ^1S$	130.240	1.38+08	2.16-01	0.5-0.5
5410.00	$7d\ ^1D - 8p\ ^1P^\circ$	130.410	4.91+07	1.29-01	4.5-2.5
5298.00	$7f\ ^1F^\circ - 8d\ ^1D$	130.480	2.55+07	7.66-02	6.5-4.5
5279.00	$7d\ ^1D - 8f\ ^1F^\circ$	130.480	1.64+08	9.60-01	4.5-6.5
5112.00	$7p\ ^1P^\circ - 8d\ ^1D$	130.480	4.91+07	1.29-01	4.5-2.5
4751.00	$7s\ ^1S - 8p\ ^1P^\circ$	130.390	4.23+07	4.29-01	0.5-0.5
4751.00	$7s\ ^1S - 8p\ ^1P^\circ$	130.390	4.23+07	4.29-01	0.5-1.5
3834.24	$3s\ ^1S - 3p\ ^1P^\circ$	82.680	5.03+07	1.11-01	0.5-0.5
5811.35	$3s\ ^1S - 3p\ ^1P^\circ$	82.600	5.13+07	2.24-01	0.5-1.5
3622.00	$6p\ ^1P^\circ - 7s\ ^1S$	127.790	2.72+08	1.78-01	0.5-0.5
3622.00	$6p\ ^1P^\circ - 7s\ ^1S$	127.790	2.72+08	1.78-01	1.5-0.5
3509.00	$6d\ ^1D - 7p\ ^1P^\circ$	128.020	8.60+07	9.52-02	4.5-2.5
3432.00	$6f\ ^1F^\circ - 7d\ ^1D$	128.110	3.37+07	4.26-02	2.5-1.5
3438.00	$6f\ ^1F^\circ - 7d\ ^1D$	128.110	3.37+07	4.26-02	3.5-2.5
3426.00	$6d\ ^1D - 7f\ ^1F^\circ$	128.120	3.34+08	8.24-01	1.5-2.5
3426.00	$6d\ ^1D - 7f\ ^1F^\circ$	128.120	3.34+08	8.24-01	2.5-3.5
3314.00	$6p\ ^1P^\circ - 7d\ ^1D$	128.110	2.02+08	5.54-01	0.5-1.5
3314.00	$6p\ ^1P^\circ - 7d\ ^1D$	128.110	2.02+08	5.54-01	1.5-2.5
1037.63	$2s\ ^1S - 2p\ ^1P^\circ$	11.950	4.02+08	6.48-02	0.5-0.5
1033.80	$2s\ ^1S - 2p\ ^1P^\circ$	11.990	4.08+08	1.96-01	0.5-1.5
1031.95	$2s\ ^1S - 2p\ ^1P^\circ$	12.010	4.09+08	1.31-01	0.5-1.5
184.12	$2p\ ^1P^\circ - 3s\ ^1S$	79.350	1.15+10	2.87-02	1.5-0.5
184.06	$2p\ ^1P^\circ - 3s\ ^1S$	79.350	1.70+10	2.87-02	2.5-0.5
183.94	$2p\ ^1P^\circ - 3s\ ^1S$	79.350	5.67+09	2.87-02	0.5-0.5
173.09	$2p\ ^1P^\circ - 3d\ ^1D$	83.650	1.47+10	6.62-02	1.5-1.5
173.09	$2p\ ^1P^\circ - 3d\ ^1D$	83.640	1.47+10	6.62-02	1.5-1.5
173.08	$2p\ ^1P^\circ - 3d\ ^1D$	83.640	8.86+10	5.97-01	1.5-2.5
172.94	$2p\ ^1P^\circ - 3d\ ^1D$	83.640	7.37+10	6.61-01	0.5-1.5
150.12	$2s\ ^1S - 3p\ ^1P^\circ$	82.580	2.50+10	8.74-02	0.5-0.5
150.10	$2s\ ^1S - 3p\ ^1P^\circ$	82.610	2.59+10	2.62-01	0.5-2.5
150.09	$2s\ ^1S - 3p\ ^1P^\circ$	82.600	2.59+10	1.75-01	0.5-1.5
129.87	$2p\ ^1P^\circ - 4d\ ^1D$	107.480	2.85+10	1.08-01	1.5-2.5
129.87	$2p\ ^1P^\circ - 4d\ ^1D$	107.470	4.76+09	1.20-02	0.5-1.5
129.87	$2p\ ^1P^\circ - 4d\ ^1D$	107.490	4.76+09	1.20-02	1.5-1.5
129.79	$2p\ ^1P^\circ - 4d\ ^1D$	107.470	2.39+10	1.21-01	0.5-1.5

ION	OXYGEN O VII				
λ (Å)	Transition	E_k (eV)	A_{ki} (s^{-1})	f_{ik}	J-J
11399.00	$3p\ ^1P^o - 3d\ ^1D$	665.700	1.13+06	3.67-02	4.0-7.0
35500.00	$3d\ ^1D - 3p\ ^1P^o$	665.700	6.00+04	7.92-03	2.0-1.0
2475.40	$2s\ ^1S - 2p\ ^1P^o$	574.020	2.46+07	6.79-02	0.0-2.0
2475.40	$2s\ ^1S - 2p\ ^1P^o$	[illegible]	2.60+07	[illegible]	0.0-1.0
1630.30	$2s\ ^3S - 2p\ ^3P^o$	668.730	7.94+07	9.49-02	2.0-3.0
1630.30	$2s\ ^3S - 2p\ ^3P^o$	[illegible]	8.20+07	[illegible]	1.0-2.0
1630.30	$2s\ ^3S - 2p\ ^3P^o$	[illegible]	8.05+07	[illegible]	1.0-1.0
135.77	$2p\ ^1P^o - 3d\ ^1D$	665.550	1.53+11	7.05-01	2.0-4.0
128.46	$2p\ ^3P^o - 3d\ ^3D$	665.140	1.62+11	6.66-01	4.0-7.0
128.25	$2s\ ^1S - 3p\ ^1P^o$	665.700	5.04+10	3.73-01	0.0-2.0
120.33	$2s\ ^3S - 3p\ ^3P^o$	664.070	5.33+10	3.47-01	2.0-3.0
21.60	$1s^1\ ^1S - 2p\ ^1P^o$	574.020	3.30+12	6.94-01	0.0-2.0
21.60	$1s^1\ ^1S - 2p\ ^1P^o$	[illegible]	3.31+12	[illegible]	0.0-1.0
18.63	$1s^1\ ^1S - 3p\ ^1P^o$	665.700	9.37+11	1.46-01	0.0-2.0
[illegible]	$1s^2\ ^1S - 2s\ ^1S$	[illegible]	2.31+06	[illegible]	0.0-0.0
[illegible]	$2s\ ^3S - 2p\ ^3P^o$	[illegible]	7.99+07	[illegible]	1.0-0.0
[illegible]	$1s^2\ ^1S - 2p\ ^3P^1$	[illegible]	5.53+08	[illegible]	0.0-1.0
[illegible]	$1s^2\ ^1S - 2p\ ^3P^1$	[illegible]	3.34+05	[illegible]	0.0-2.0