

Nitrogen Atom

$$Z = 7$$

$$\text{Atomic Mass} = 14.0067$$

$$\sigma_a(\text{Mb}) = 109.76097 \frac{df}{dE} (\text{eV}^{-1})$$

$$\mu_m = \sigma_a \cdot N_A \cdot M_A^{-1}$$

Table I. Discrete oscillator strength, f_n .

Energy (eV)	f_n	λ (Å)	Energy (eV)	f_n	λ (Å)
1.0332E+01	2.5900E-01	1.2000E+03	1.3000E+01	7.3000E-02	9.5369E+02
1.2862E+01	2.8200E-02	9.6398E+02	1.3680E+01	3.6900E-02	9.0634E+02
1.3606E+01	1.0900E-02	9.1127E+02	1.3991E+01	1.9700E-02	8.8619E+02
1.3928E+01	5.3500E-03	8.9021E+02	1.4184E+01	1.1700E-02	8.7410E+02
1.4176E+01	3.0400E-03	8.7459E+02	1.4383E+01	2.9200E-02 ^{b)}	8.6202E+02
1.4344E+01	1.8900E-03	8.6438E+02	1.3018E+01	6.7500E-03	9.5243E+02
1.4452E+01	1.2600E-03	8.5792E+02	1.2907E+01	1.8800E-03	9.6061E+02
1.4464E+01	4.1000E-03 ^{a)}	8.5716E+02	1.0926E+01	8.8200E-02	1.1348E+03

^{a)} Represents $\sum_{n=10}^{\infty} f_n$ for the ns(⁴P) series.

^{b)} Represents $\sum_{n=7}^{\infty} f_n$ for the nd(⁴P) series.

Table II. Discrete oscillator strength, f_n , for resonances between 17.9 eV and 20.3 eV and pre-K edge.

Energy (eV)	f_n	λ (Å)	Energy (eV)	f_n	λ (Å)
1.7898E+01	5.3100E-03	6.9273E+02	2.0181E+01	4.3900E-04	6.1436E+02
1.9148E+01	2.2000E-03	6.4752E+02	2.0209E+01	3.9800E-04	6.1350E+02
1.9629E+01	1.6300E-03	6.3162E+02	2.0230E+01	3.3400E-04	6.1288E+02
1.9867E+01	8.3700E-04	6.2406E+02	2.0246E+01	2.5800E-04	6.1238E+02
2.0002E+01	7.5300E-04	6.1985E+02	2.0259E+01	2.0300E-04	6.1200E+02
2.0086E+01	5.4500E-04	6.1726E+02	2.0296E+01	1.1500E-04	6.1088E+02
2.0140E+01	3.7800E-04	6.1563E+02	4.0080E+02	1.2000E-01	3.0934E+01

Table III. Oscillator-strength density, df/dE , photoabsorption cross section, σ_a , and mass absorption coefficient, μ_m .

Energy (eV)	f_n (eV ⁻¹)	σ_a (Mb)	μ_m (cm ² g ⁻¹)	λ (Å)
1.4534E+01	1.1653E-01	1.2791E+01	5.4993E+05	8.5306E+02
1.5000E+01	1.2139E-01	1.3324E+01	5.7287E+05	8.2656E+02
1.7500E+01	1.3101E-01	1.4380E+01	6.1826E+05	7.0848E+02
2.0000E+01	1.2663E-01	1.3899E+01	5.9760E+05	6.1992E+02
2.2500E+01	1.1743E-01	1.2889E+01	5.5416E+05	5.5104E+02
2.5000E+01	1.0703E-01	1.1747E+01	5.0507E+05	4.9594E+02
2.7500E+01	9.6880E-02	1.0634E+01	4.5719E+05	4.5085E+02
3.0000E+01	8.5963E-02	9.4354E+00	4.0567E+05	4.1328E+02
3.5000E+01	7.2056E-02	7.9089E+00	3.4004E+05	3.5424E+02
4.0000E+01	5.9919E-02	6.5768E+00	2.8277E+05	3.0996E+02
4.5000E+01	4.9984E-02	5.4863E+00	2.3588E+05	2.7552E+02
5.0000E+01	4.2460E-02	4.6605E+00	2.0037E+05	2.4797E+02
6.0000E+01	2.9614E-02	3.2505E+00	1.3975E+05	2.0664E+02
7.0000E+01	2.0852E-02	2.2888E+00	9.8405E+04	1.7712E+02
8.0000E+01	1.5097E-02	1.6571E+00	7.1246E+04	1.5498E+02
9.0000E+01	1.1253E-02	1.2352E+00	5.3105E+04	1.3776E+02
1.0000E+02	8.6127E-03	9.4534E-01	4.0645E+04	1.2398E+02
1.2500E+02	4.8531E-03	5.3268E-01	2.2902E+04	9.9187E+01
1.5000E+02	3.0311E-03	3.3270E-01	1.4304E+04	8.2656E+01
1.7500E+02	2.0389E-03	2.2379E-01	9.6218E+03	7.0848E+01
2.0000E+02	1.7048E-03	1.8712E-01	8.0453E+03	6.1992E+01
2.2500E+02	1.2995E-03	1.4263E-01	6.1325E+03	5.5104E+01
2.5000E+02	1.0191E-03	1.1186E-01	4.8092E+03	4.9594E+01
2.7500E+02	8.1833E-04	8.9820E-02	3.8618E+03	4.5085E+01
3.0000E+02	6.7028E-04	7.3571E-02	3.1632E+03	4.1328E+01
3.5000E+02	4.7177E-04	5.1782E-02	2.2263E+03	3.5424E+01
4.0000E+02	3.4901E-04	3.8307E-02	1.6470E+03	3.0996E+01
4.0990E+02	3.3037E-04	3.6262E-02	1.5591E+03	3.0247E+01
4.0990E+02	6.4535E-03	7.0834E-01	3.0455E+04	3.0247E+01
4.5000E+02	5.2494E-03	5.7618E-01	2.4773E+04	2.7552E+01
5.0000E+02	4.1161E-03	4.5179E-01	1.9425E+04	2.4797E+01
6.0000E+02	2.6473E-03	2.9057E-01	1.2493E+04	2.0664E+01
7.0000E+02	1.7936E-03	1.9686E-01	8.4640E+03	1.7712E+01
8.0000E+02	1.2681E-03	1.3919E-01	5.9843E+03	1.5498E+01
9.0000E+02	9.2845E-04	1.0191E-01	4.3815E+03	1.3776E+01
1.0000E+03	6.9971E-04	7.6800E-02	3.3020E+03	1.2398E+01

Table III. Oscillator-strength density, df/dE , photoabsorption cross section, σ_a , and mass absorption coefficient, μ_m . (Continued)

Energy (eV)	f_n (eV ⁻¹)	σ_a (Mb)	μ_m (cm ² g ⁻¹)	λ (Å)
1.2500E+03	3.8052E-04	4.1766E-02	1.7957E+03	9.9187E+00
1.5000E+03	2.2951E-04	2.5191E-02	1.0831E+03	8.2656E+00
1.7500E+03	1.4905E-04	1.6360E-02	7.0339E+02	7.0848E+00
2.0000E+03	1.0231E-04	1.1230E-02	4.8282E+02	6.1992E+00
2.2500E+03	7.1319E-05	7.8281E-03	3.3657E+02	5.5104E+00
2.5000E+03	5.2284E-05	5.7388E-03	2.4674E+02	4.9594E+00
2.7500E+03	3.9426E-05	4.3274E-03	1.8606E+02	4.5085E+00
3.0000E+03	3.0430E-05	3.3400E-03	1.4360E+02	4.1328E+00
3.5000E+03	1.9169E-05	2.1040E-03	9.0459E+01	3.5424E+00
4.0000E+03	1.2797E-05	1.4046E-03	6.0389E+01	3.0996E+00
4.5000E+03	8.9312E-06	9.8030E-04	4.2148E+01	2.7552E+00
5.0000E+03	6.4565E-06	7.0867E-04	3.0469E+01	2.4797E+00
6.0000E+03	3.6572E-06	4.0142E-04	1.7259E+01	2.0664E+00
7.0000E+03	2.2440E-06	2.4630E-04	1.0590E+01	1.7712E+00
8.0000E+03	1.4596E-06	1.6021E-04	6.8882E+00	1.5498E+00
9.0000E+03	9.9254E-07	1.0894E-04	4.6839E+00	1.3776E+00
1.0000E+04	7.1411E-07	7.8381E-05	3.3700E+00	1.2398E+00
1.2500E+04	3.4836E-07	3.8237E-05	1.6440E+00	9.9187E-01
1.5000E+04	1.9377E-07	2.1268E-05	9.1442E-01	8.2656E-01
1.7500E+04	1.1799E-07	1.2950E-05	5.5680E-01	7.0848E-01
2.0000E+04	7.6783E-08	8.4278E-06	3.6235E-01	6.1992E-01
2.2500E+04	5.2564E-08	5.7694E-06	2.4806E-01	5.5104E-01
2.5000E+04	3.7465E-08	4.1122E-06	1.7680E-01	4.9594E-01
2.7500E+04	2.7498E-08	3.0182E-06	1.2977E-01	4.5085E-01
3.0000E+04	2.0650E-08	2.2665E-06	9.7449E-02	4.1328E-01
3.5000E+04	1.2429E-08	1.3642E-06	5.8654E-02	3.5424E-01
4.0000E+04	8.0070E-09	8.7886E-07	3.7786E-02	3.0996E-01
4.5000E+04	5.4329E-09	5.9632E-07	2.5638E-02	2.7552E-01
5.0000E+04	3.8404E-09	4.2152E-07	1.8123E-02	2.4797E-01
6.0000E+04	2.1070E-09	2.3127E-07	9.9432E-03	2.0664E-01
7.0000E+04	1.2683E-09	1.3921E-07	5.9854E-03	1.7712E-01
8.0000E+04	8.1695E-10	8.9669E-08	3.8553E-03	1.5498E-01
9.0000E+04	5.5405E-10	6.0813E-08	2.6146E-03	1.3776E-01
1.0000E+05	3.9138E-10	4.2958E-08	1.8470E-03	1.2398E-01

When photon energy, E , is higher than 10^5 eV, the photoabsorption cross section, σ_a , in Mb is given by

$$\sigma_a = 680 (Z - 0.3)^6 \left(\frac{Ry}{E} \right)^4 \frac{\exp[-4\chi \arctan(\chi^{-1})]}{1 - \exp(-2\pi\chi)} .$$

Here E is photon energy in eV and χ is given by

$$\chi = \sqrt{\frac{E_K}{E - E_K}} ,$$

where $E_K = 409.9$ eV.

