

Neon Atom

$Z = 10$

Atomic Mass = 20.1797

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

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

Table I. Discrete oscillator strength, f_n , for nl and nl' transitions.

Energy (eV)	f_n	λ (Å)	Energy (eV)	f_n	λ (Å)
1.6671E+01	1.1000E-02	7.4372E+02	1.6848E+01	1.4500E-01	7.3590E+02
1.9688E+01	1.2850E-02	6.2974E+02	1.9780E+01	1.5900E-02	6.2682E+02
2.0571E+01	6.3000E-03	6.0273E+02	2.0663E+01	4.4000E-03	6.0004E+02
2.0949E+01	3.3000E-03	5.9183E+02	2.1044E+01	1.6000E-03	5.8918E+02
2.1327E+01	6.4700E-03	5.8136E+02	2.1323E+01	3.1500E-03	5.8145E+02
2.0033E+01	1.9000E-02	6.1889E+02	2.0139E+01	6.5000E-03	6.1563E+02
2.0706E+01	9.4000E-03	5.9880E+02	2.0806E+01	4.4000E-03	5.9592E+02
2.1016E+01	5.4000E-03	5.8996E+02	2.1114E+01	2.4000E-03	5.8721E+02
2.1348E+01	1.1250E-02	5.8079E+02	2.1480E+01	5.7000E-03	5.7722E+02
2.1622E+01	3.8000E-03	5.7342E+02			

Table II. Discrete oscillator strength, f_n , for resonance transitions.

Energy (eV)	f_n	λ (Å)	Energy (eV)	f_n	λ (Å)
4.5546E+01	1.4200E-03	2.7222E+02	4.8832E+01	7.3000E-04	2.5390E+02
4.7121E+01	4.6000E-04	2.6312E+02	8.6705E+02	4.1000E-03	1.4300E+01
4.7692E+01	2.1000E-04	2.5997E+02	8.6868E+02	2.0000E-03	1.4273E+01
4.8071E+01	3.2000E-04	2.5792E+02	8.6923E+02	5.8000E-04	1.4264E+01
4.4979E+01	5.6000E-04	2.7565E+02	8.6963E+02	2.2000E-04	1.4257E+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)
2.1661E+01	5.7632E-02	6.3258E+00	1.8878E+05	5.7238E+02
2.2500E+01	6.3600E-02	6.9808E+00	2.0833E+05	5.5104E+02
2.5000E+01	7.3604E-02	8.0788E+00	2.4109E+05	4.9594E+02
2.7500E+01	7.8106E-02	8.5729E+00	2.5584E+05	4.5085E+02
3.0000E+01	8.0157E-02	8.7981E+00	2.6256E+05	4.1328E+02
3.5000E+01	8.0435E-02	8.8287E+00	2.6347E+05	3.5424E+02
4.0000E+01	7.7798E-02	8.5392E+00	2.5483E+05	3.0996E+02
4.5000E+01	7.3653E-02	8.0842E+00	2.4125E+05	2.7552E+02
5.0000E+01	6.8318E-02	7.4987E+00	2.2378E+05	2.4797E+02
6.0000E+01	6.0710E-02	6.6636E+00	1.9886E+05	2.0664E+02
7.0000E+01	5.4340E-02	5.9644E+00	1.7799E+05	1.7712E+02
8.0000E+01	4.7276E-02	5.1890E+00	1.5485E+05	1.5498E+02
9.0000E+01	4.0503E-02	4.4456E+00	1.3267E+05	1.3776E+02
1.0000E+02	3.4528E-02	3.7898E+00	1.1310E+05	1.2398E+02
1.2500E+02	2.3400E-02	2.5684E+00	7.6649E+04	9.9187E+01
1.5000E+02	1.6407E-02	1.8009E+00	5.3742E+04	8.2656E+01
1.7500E+02	1.1938E-02	1.3103E+00	3.9104E+04	7.0848E+01
2.0000E+02	8.9794E-03	9.8559E-01	2.9413E+04	6.1992E+01
2.2500E+02	6.9482E-03	7.6264E-01	2.2759E+04	5.5104E+01
2.5000E+02	5.2869E-03	5.8029E-01	1.7317E+04	4.9594E+01
2.7500E+02	4.2119E-03	4.6230E-01	1.3796E+04	4.5085E+01
3.0000E+02	3.3982E-03	3.7299E-01	1.1131E+04	4.1328E+01
3.5000E+02	2.2927E-03	2.5165E-01	7.5098E+03	3.5424E+01
4.0000E+02	1.6214E-03	1.7796E-01	5.3109E+03	3.0996E+01
4.5000E+02	1.1901E-03	1.3063E-01	3.8983E+03	2.7552E+01
5.0000E+02	9.0038E-04	9.8827E-02	2.9492E+03	2.4797E+01
6.0000E+02	5.5322E-04	6.0722E-02	1.8121E+03	2.0664E+01
7.0000E+02	3.6536E-04	4.0102E-02	1.1968E+03	1.7712E+01
8.0000E+02	2.5470E-04	2.7956E-02	8.3427E+02	1.5498E+01
8.7025E+02	2.0281E-04	2.2260E-02	6.6430E+02	1.4247E+01
8.7025E+02	3.3058E-03	3.6285E-01	1.0828E+04	1.4247E+01
9.0000E+02	3.0431E-03	3.3402E-01	9.9679E+03	1.3776E+01
1.0000E+03	2.3400E-03	2.5684E-01	7.6649E+03	1.2398E+01
1.2500E+03	1.3220E-03	1.4510E-01	4.3302E+03	9.9187E+00
1.5000E+03	8.1888E-04	8.9881E-02	2.6823E+03	8.2656E+00
1.7500E+03	5.4243E-04	5.9538E-02	1.7768E+03	7.0848E+00

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)
2.0000E+03	3.7810E-04	4.1501E-02	1.2385E+03	6.1992E+00
2.2500E+03	2.7431E-04	3.0109E-02	8.9853E+02	5.5104E+00
2.5000E+03	2.0553E-04	2.2559E-02	6.7321E+02	4.9594E+00
2.7500E+03	1.5812E-04	1.7355E-02	5.1793E+02	4.5085E+00
3.0000E+03	1.2298E-04	1.3498E-02	4.0283E+02	4.1328E+00
3.5000E+03	7.9354E-05	8.7100E-03	2.5993E+02	3.5424E+00
4.0000E+03	5.4014E-05	5.9286E-03	1.7692E+02	3.0996E+00
4.5000E+03	3.8327E-05	4.2068E-03	1.2554E+02	2.7552E+00
5.0000E+03	2.8117E-05	3.0861E-03	9.2099E+01	2.4797E+00
6.0000E+03	1.6346E-05	1.7942E-03	5.3543E+01	2.0664E+00
7.0000E+03	1.0269E-05	1.1272E-03	3.3637E+01	1.7712E+00
8.0000E+03	6.8324E-06	7.4993E-04	2.2380E+01	1.5498E+00
9.0000E+03	4.7508E-06	5.2145E-04	1.5561E+01	1.3776E+00
1.0000E+04	3.3811E-06	3.7111E-04	1.1075E+01	1.2398E+00
1.2500E+04	1.6929E-06	1.8581E-04	5.5452E+00	9.9187E-01
1.5000E+04	9.6208E-07	1.0560E-04	3.1513E+00	8.2656E-01
1.7500E+04	5.9402E-07	6.5201E-05	1.9458E+00	7.0848E-01
2.0000E+04	3.8919E-07	4.2718E-05	1.2748E+00	6.1992E-01
2.2500E+04	2.6802E-07	2.9418E-05	8.7792E-01	5.5104E-01
2.5000E+04	1.9199E-07	2.1073E-05	6.2888E-01	4.9594E-01
2.7500E+04	1.4163E-07	1.5545E-05	4.6391E-01	4.5085E-01
3.0000E+04	1.0688E-07	1.1731E-05	3.5008E-01	4.1328E-01
3.5000E+04	6.4857E-08	7.1188E-06	2.1244E-01	3.5424E-01
4.0000E+04	4.2081E-08	4.6188E-06	1.3784E-01	3.0996E-01
4.5000E+04	2.8732E-08	3.1536E-06	9.4113E-02	2.7552E-01
5.0000E+04	2.0424E-08	2.2418E-06	6.6900E-02	2.4797E-01
6.0000E+04	1.1316E-08	1.2420E-06	3.7065E-02	2.0664E-01
7.0000E+04	6.8669E-09	7.5372E-07	2.2493E-02	1.7712E-01
8.0000E+04	4.4579E-09	4.8930E-07	1.4602E-02	1.5498E-01
9.0000E+04	3.0524E-09	3.3503E-07	9.9982E-03	1.3776E-01
1.0000E+05	2.1766E-09	2.3891E-07	7.1296E-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 χ is represented by

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

where $E_K = 870.25$ eV.

