

Calculation of electronic excitation cross sections and rate coefficients for boron monohydride (BH)

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Calculation of electronic excitation cross sections and rate coefficients for boron monohydride (BH)

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Appendix

The numerical data for the elastic, excitation, and ionization cross sections from the ground state presented in the paper are summarized in Tables A.1– A.2. The results are based on the CAS-CI calculation for 45 target states with the cc-pVDZ basis set and the internuclear distance of $r_e = 1.2324 \text{ \AA}$. The Born correction is taken into account for elastic and excitation of the dipole transition.

Table A.1. Elastic and excitation cross sections in \AA^2 unit by R-matrix calculation.

electron energy (eV)	elastic	a $^3\Pi$	A $^1\Pi$	b $^3\Sigma^-$	C $^1\Delta$	B $^1\Sigma^+$	c $^3\Sigma^+$
0.10	6.1408e+02	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
0.20	3.4555e+02	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
0.30	2.4926e+02	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
0.40	1.9949e+02	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
0.50	1.6900e+02	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
0.60	1.4831e+02	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
0.70	1.3327e+02	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
0.80	1.2176e+02	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
0.90	1.1255e+02	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
1.00	1.0456e+02	5.0477e-01	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
1.10	9.8364e+01	1.3778e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
1.20	9.3191e+01	2.1557e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
1.30	8.8718e+01	3.1802e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
1.40	8.4751e+01	3.6129e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
1.50	8.1292e+01	3.5371e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
1.60	7.8250e+01	3.4584e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
1.70	7.5535e+01	3.4324e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
1.80	7.3088e+01	3.4378e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
1.90	7.0867e+01	3.4573e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
2.00	6.8839e+01	3.4797e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
2.10	6.6978e+01	3.4969e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
2.20	6.5262e+01	3.5039e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
2.30	6.3669e+01	3.4998e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
2.40	6.2184e+01	3.4858e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
2.50	6.0788e+01	3.4646e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
2.60	5.9466e+01	3.4394e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
2.70	5.8194e+01	3.4142e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
2.80	5.6898e+01	3.3991e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
2.90	5.5508e+01	3.2957e+00	5.4082e-01	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
3.00	5.4689e+01	3.1919e+00	7.9254e-01	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
3.10	5.3883e+01	3.1037e+00	9.5717e-01	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
3.20	5.3099e+01	3.0234e+00	1.0855e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
3.30	5.2340e+01	2.9492e+00	1.1927e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
3.40	5.1609e+01	2.8802e+00	1.2863e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
3.50	5.0906e+01	2.8159e+00	1.3710e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
3.60	5.0230e+01	2.7556e+00	1.4495e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
3.70	4.9583e+01	2.6990e+00	1.5236e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
3.80	4.8962e+01	2.6458e+00	1.5946e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
3.90	4.8368e+01	2.5956e+00	1.6630e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
4.00	4.7799e+01	2.5481e+00	1.7292e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
4.10	4.7255e+01	2.5031e+00	1.7933e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
4.20	4.6735e+01	2.4605e+00	1.8552e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
4.30	4.6236e+01	2.4200e+00	1.9148e+00	0.0000e+00	0.0000e+00	0.0000e+00	0.0000e+00
4.40	4.5755e+01	2.3811e+00	1.9715e+00	2.3760e-03	0.0000e+00	0.0000e+00	0.0000e+00
4.50	4.5284e+01	2.3424e+00	2.0258e+00	1.7837e-02	0.0000e+00	0.0000e+00	0.0000e+00
4.60	4.4824e+01	2.3035e+00	2.0783e+00	5.0066e-02	0.0000e+00	0.0000e+00	0.0000e+00
4.70	4.4372e+01	2.2645e+00	2.1295e+00	1.0365e-01	0.0000e+00	0.0000e+00	0.0000e+00
4.80	4.3935e+01	2.2277e+00	2.1803e+00	1.7350e-01	0.0000e+00	0.0000e+00	0.0000e+00
4.90	4.3532e+01	2.1970e+00	2.2304e+00	2.3460e-01	0.0000e+00	0.0000e+00	0.0000e+00
5.00	4.3176e+01	2.1738e+00	2.2779e+00	2.5946e-01	0.0000e+00	0.0000e+00	0.0000e+00

Table A.1. Elastic and excitation cross sections in \AA^2 unit by R-matrix calculation (cont.).

electron energy (eV)	elastic	a $^3\Pi$	A $^1\Pi$	b $^3\Sigma^-$	C $^1\Delta$	B $^1\Sigma^+$	c $^3\Sigma^+$
5.10	4.2857e+01	2.1551e+00	2.3213e+00	2.4854e-01	0.0000e+00	0.0000e+00	0.0000e+00
5.20	4.2559e+01	2.1375e+00	2.3604e+00	2.2060e-01	0.0000e+00	0.0000e+00	0.0000e+00
5.30	4.2272e+01	2.1194e+00	2.3959e+00	1.9004e-01	0.0000e+00	0.0000e+00	0.0000e+00
5.40	4.1994e+01	2.1006e+00	2.4284e+00	1.6274e-01	0.0000e+00	0.0000e+00	0.0000e+00
5.50	4.1724e+01	2.0814e+00	2.4582e+00	1.4000e-01	0.0000e+00	0.0000e+00	0.0000e+00
5.60	4.1461e+01	2.0620e+00	2.4857e+00	1.2143e-01	0.0000e+00	0.0000e+00	0.0000e+00
5.70	4.1207e+01	2.0425e+00	2.5110e+00	1.0629e-01	0.0000e+00	0.0000e+00	0.0000e+00
5.80	4.0961e+01	2.0231e+00	2.5343e+00	9.3837e-02	0.0000e+00	0.0000e+00	0.0000e+00
5.90	4.0724e+01	2.0038e+00	2.5556e+00	8.3479e-02	0.0000e+00	0.0000e+00	0.0000e+00
6.00	4.0494e+01	1.9846e+00	2.5751e+00	7.4744e-02	0.0000e+00	0.0000e+00	0.0000e+00
6.10	4.0272e+01	1.9654e+00	2.5928e+00	6.7262e-02	0.0000e+00	0.0000e+00	0.0000e+00
6.20	4.0058e+01	1.9459e+00	2.6089e+00	6.0724e-02	0.0000e+00	0.0000e+00	0.0000e+00
6.30	3.9852e+01	1.9227e+00	2.6179e+00	5.4631e-02	4.5022e-03	0.0000e+00	0.0000e+00
6.40	3.9653e+01	1.9024e+00	2.6229e+00	4.8222e-02	1.3935e-02	0.0000e+00	0.0000e+00
6.50	3.9461e+01	1.8830e+00	2.6303e+00	4.2915e-02	2.0301e-02	0.0000e+00	0.0000e+00
6.60	3.9276e+01	1.8640e+00	2.6378e+00	3.8607e-02	2.5563e-02	0.0000e+00	0.0000e+00
6.70	3.9097e+01	1.8450e+00	2.6454e+00	3.5077e-02	3.0048e-02	0.0000e+00	0.0000e+00
6.80	3.8926e+01	1.8261e+00	2.6531e+00	3.2142e-02	3.3961e-02	0.0000e+00	0.0000e+00
6.90	3.8763e+01	1.8071e+00	2.6611e+00	2.9664e-02	3.7472e-02	0.0000e+00	0.0000e+00
7.00	3.8609e+01	1.7880e+00	2.6696e+00	2.7543e-02	4.0746e-02	0.0000e+00	0.0000e+00
7.10	3.8466e+01	1.7688e+00	2.6792e+00	2.5701e-02	4.3957e-02	0.0000e+00	0.0000e+00
7.20	3.8336e+01	1.7492e+00	2.6906e+00	2.4084e-02	4.7323e-02	0.0000e+00	0.0000e+00
7.30	3.8223e+01	1.7294e+00	2.7048e+00	2.2644e-02	5.1154e-02	0.0000e+00	0.0000e+00
7.40	3.8128e+01	1.7104e+00	2.7216e+00	2.1327e-02	5.6038e-02	1.7523e-03	0.0000e+00
7.50	3.8053e+01	1.6870e+00	2.7412e+00	2.0324e-02	6.2439e-02	1.2929e-02	0.0000e+00
7.60	3.8017e+01	1.6629e+00	2.7782e+00	1.9692e-02	7.1952e-02	2.0290e-02	0.0000e+00
7.70	3.8035e+01	1.6375e+00	2.8394e+00	1.9375e-02	8.7197e-02	2.7428e-02	0.0000e+00
7.80	3.8129e+01	1.6101e+00	2.9449e+00	1.9473e-02	1.1364e-01	3.4817e-02	0.0000e+00
7.90	3.8325e+01	1.5808e+00	3.1377e+00	2.0350e-02	1.6335e-01	4.2830e-02	0.0000e+00
8.00	3.8605e+01	1.5510e+00	3.5083e+00	2.2986e-02	2.6303e-01	5.1988e-02	0.0000e+00
8.10	3.8598e+01	1.5300e+00	4.1661e+00	2.9311e-02	4.5010e-01	6.3014e-02	0.0000e+00
8.20	3.6960e+01	1.4950e+00	4.6928e+00	3.8069e-02	6.1617e-01	7.5800e-02	0.0000e+00
8.30	3.4257e+01	1.5310e+00	3.8873e+00	2.8792e-02	3.8518e-01	8.7931e-02	0.0000e+00
8.40	3.3039e+01	1.5398e+00	3.4721e+00	2.3806e-02	2.5167e-01	9.9099e-02	0.0000e+00
8.50	3.2036e+01	1.5456e+00	3.3171e+00	2.1423e-02	1.9620e-01	1.0730e-01	0.0000e+00
8.60	3.1260e+01	1.5451e+00	3.2317e+00	2.0059e-02	1.6763e-01	1.1218e-01	0.0000e+00
8.70	3.0740e+01	1.5379e+00	3.1676e+00	1.9169e-02	1.5041e-01	1.1516e-01	0.0000e+00
8.80	3.0409e+01	1.5263e+00	3.1146e+00	1.8533e-02	1.3901e-01	1.1757e-01	0.0000e+00
8.90	3.0189e+01	1.5127e+00	3.0706e+00	1.8049e-02	1.3104e-01	1.2005e-01	0.0000e+00
9.00	3.0026e+01	1.4983e+00	3.0341e+00	1.7664e-02	1.2527e-01	1.2280e-01	0.0000e+00
9.10	2.9888e+01	1.4838e+00	3.0038e+00	1.7346e-02	1.2100e-01	1.2580e-01	0.0000e+00
9.20	2.9761e+01	1.4696e+00	2.9784e+00	1.7077e-02	1.1777e-01	1.2899e-01	0.0000e+00
9.30	2.9635e+01	1.4557e+00	2.9569e+00	1.6843e-02	1.1531e-01	1.3230e-01	0.0000e+00
9.40	2.9507e+01	1.4422e+00	2.9385e+00	1.6635e-02	1.1343e-01	1.3566e-01	0.0000e+00
9.50	2.9375e+01	1.4289e+00	2.9224e+00	1.6449e-02	1.1198e-01	1.3903e-01	0.0000e+00
9.60	2.9239e+01	1.4160e+00	2.9082e+00	1.6279e-02	1.1088e-01	1.4238e-01	0.0000e+00
9.70	2.9098e+01	1.4034e+00	2.8956e+00	1.6123e-02	1.1006e-01	1.4568e-01	0.0000e+00
9.80	2.8953e+01	1.3909e+00	2.8842e+00	1.5978e-02	1.0948e-01	1.4892e-01	0.0000e+00
9.90	2.8805e+01	1.3786e+00	2.8738e+00	1.5843e-02	1.0908e-01	1.5210e-01	0.0000e+00
10.00	2.8654e+01	1.3664e+00	2.8643e+00	1.5718e-02	1.0886e-01	1.5522e-01	0.0000e+00

Table A.1. Elastic and excitation cross sections in \AA^2 unit by R-matrix calculation (cont.).

electron energy (eV)	elastic	a $^3\Pi$	A $^1\Pi$	b $^3\Sigma^-$	C $^1\Delta$	B $^1\Sigma^+$	c $^3\Sigma^+$
10.10	2.8500e+01	1.3543e+00	2.8555e+00	1.5601e-02	1.0879e-01	1.5829e-01	0.0000e+00
10.20	2.8343e+01	1.3422e+00	2.8474e+00	1.5495e-02	1.0887e-01	1.6131e-01	0.0000e+00
10.30	2.8185e+01	1.3300e+00	2.8398e+00	1.5399e-02	1.0909e-01	1.6430e-01	0.0000e+00
10.40	2.8024e+01	1.3179e+00	2.8328e+00	1.5316e-02	1.0945e-01	1.6727e-01	0.0000e+00
10.50	2.7861e+01	1.3055e+00	2.8264e+00	1.5251e-02	1.0997e-01	1.7023e-01	0.0000e+00
10.60	2.7697e+01	1.2930e+00	2.8206e+00	1.5211e-02	1.1067e-01	1.7322e-01	0.0000e+00
10.70	2.7529e+01	1.2802e+00	2.8156e+00	1.5214e-02	1.1156e-01	1.7627e-01	0.0000e+00
10.80	2.7360e+01	1.2612e+00	2.8130e+00	1.5373e-02	1.1244e-01	1.7940e-01	0.0000e+00
10.90	2.7175e+01	1.2417e+00	2.8035e+00	1.5647e-02	1.1388e-01	1.8364e-01	1.9423e-02
11.00	2.7014e+01	1.2280e+00	2.7865e+00	1.6113e-02	1.1388e-01	1.8543e-01	3.1404e-02
11.10	2.6855e+01	1.2198e+00	2.7678e+00	1.6571e-02	1.1277e-01	1.8652e-01	4.2961e-02
11.20	2.6697e+01	1.2133e+00	2.7505e+00	1.6948e-02	1.1117e-01	1.8736e-01	5.3772e-02
11.30	2.6540e+01	1.2064e+00	2.7358e+00	1.7270e-02	1.0956e-01	1.8812e-01	6.3846e-02
11.40	2.6392e+01	1.1908e+00	2.7237e+00	1.7363e-02	1.0829e-01	1.8847e-01	7.3300e-02
11.50	2.6224e+01	1.1846e+00	2.7098e+00	1.7645e-02	1.0666e-01	1.8966e-01	8.2688e-02
11.60	2.6059e+01	1.1723e+00	2.6992e+00	1.8041e-02	1.0517e-01	1.9042e-01	9.1757e-02
11.70	2.5894e+01	1.1571e+00	2.6903e+00	1.8550e-02	1.0375e-01	1.9105e-01	1.0052e-01
11.80	2.5728e+01	1.1394e+00	2.6826e+00	1.9198e-02	1.0238e-01	1.9160e-01	1.0897e-01
11.90	2.5563e+01	1.1194e+00	2.6758e+00	2.0004e-02	1.0104e-01	1.9210e-01	1.1711e-01
12.00	2.5399e+01	1.0976e+00	2.6697e+00	2.0975e-02	9.9681e-02	1.9259e-01	1.2496e-01
12.10	2.5238e+01	1.0742e+00	2.6639e+00	2.2106e-02	9.8257e-02	1.9313e-01	1.3252e-01
12.20	2.5081e+01	1.0498e+00	2.6581e+00	2.2972e-02	9.6555e-02	1.9383e-01	1.3984e-01
12.30	2.4928e+01	1.0284e+00	2.6511e+00	2.3646e-02	9.4889e-02	1.9465e-01	1.4663e-01
12.40	2.4778e+01	1.0101e+00	2.6433e+00	2.4220e-02	9.3360e-02	1.9545e-01	1.5280e-01
12.50	2.4631e+01	9.9432e-01	2.6347e+00	2.4732e-02	9.1910e-02	1.9621e-01	1.5832e-01
12.60	2.4489e+01	9.8176e-01	2.6257e+00	2.4864e-02	9.0445e-02	1.9690e-01	1.6301e-01
12.70	2.4349e+01	9.7182e-01	2.6172e+00	2.4520e-02	8.9130e-02	1.9745e-01	1.6707e-01
12.80	2.4211e+01	9.6312e-01	2.6093e+00	2.3951e-02	8.7999e-02	1.9787e-01	1.7069e-01
12.90	2.4075e+01	9.5490e-01	2.6020e+00	2.3299e-02	8.7045e-02	1.9816e-01	1.7396e-01
13.00	2.3941e+01	9.4679e-01	2.5951e+00	2.2641e-02	8.6246e-02	1.9835e-01	1.7692e-01
13.10	2.3809e+01	9.3859e-01	2.5885e+00	2.2011e-02	8.5583e-02	1.9843e-01	1.7959e-01
13.20	2.3680e+01	9.3026e-01	2.5821e+00	2.1424e-02	8.5043e-02	1.9841e-01	1.8197e-01
13.30	2.3552e+01	9.2177e-01	2.5758e+00	2.0881e-02	8.4623e-02	1.9831e-01	1.8404e-01
13.40	2.3427e+01	9.1313e-01	2.5696e+00	2.0382e-02	8.4341e-02	1.9811e-01	1.8580e-01
13.50	2.3305e+01	9.0432e-01	2.5632e+00	1.9912e-02	8.3406e-02	1.9786e-01	1.8723e-01
13.60	2.3183e+01	8.9557e-01	2.5571e+00	1.9338e-02	8.2477e-02	1.9740e-01	1.8834e-01
13.70	2.3063e+01	8.8637e-01	2.5511e+00	1.8790e-02	8.1791e-02	1.9680e-01	1.8909e-01
13.80	2.2946e+01	8.7697e-01	2.5451e+00	1.8286e-02	8.1200e-02	1.9606e-01	1.8945e-01
13.90	2.2831e+01	8.6750e-01	2.5391e+00	1.7827e-02	8.0698e-02	1.9517e-01	1.8942e-01
14.00	2.2718e+01	8.5802e-01	2.5329e+00	1.7408e-02	8.0300e-02	1.9410e-01	1.8899e-01
14.10	2.2608e+01	8.4852e-01	2.5265e+00	1.7026e-02	8.0039e-02	1.9288e-01	1.8838e-01
14.20	2.2488e+01	8.3864e-01	2.5197e+00	1.6676e-02	7.9705e-02	1.9047e-01	1.8573e-01
14.30	2.2360e+01	8.2879e-01	2.5125e+00	1.6359e-02	7.9404e-02	1.8762e-01	1.8107e-01
14.40	2.2228e+01	8.1923e-01	2.5047e+00	1.6020e-02	7.9081e-02	1.8465e-01	1.7686e-01
14.50	2.2096e+01	8.1016e-01	2.4969e+00	1.5688e-02	7.8713e-02	1.8167e-01	1.7314e-01
14.60	2.1962e+01	8.0142e-01	2.4891e+00	1.5378e-02	7.8206e-02	1.7888e-01	1.7012e-01
14.70	2.1828e+01	7.9280e-01	2.4813e+00	1.5074e-02	7.7426e-02	1.7655e-01	1.6827e-01
14.80	2.1693e+01	7.8420e-01	2.4734e+00	1.4791e-02	7.6214e-02	1.7504e-01	1.6823e-01
14.90	2.1557e+01	7.7553e-01	2.4656e+00	1.4537e-02	7.4421e-02	1.7474e-01	1.7060e-01
15.00	2.1421e+01	7.6656e-01	2.4578e+00	1.4439e-02	7.1638e-02	1.7612e-01	1.7629e-01

Table A.1. Elastic and excitation cross sections in \AA^2 unit by R-matrix calculation (cont.).

electron energy (eV)	elastic	a $^3\Pi$	A $^1\Pi$	b $^3\Sigma^-$	C $^1\Delta$	B $^1\Sigma^+$	c $^3\Sigma^+$
15.10	2.1289e+01	7.5829e-01	2.4504e+00	1.4262e-02	6.8232e-02	1.7886e-01	1.8355e-01
15.20	2.1160e+01	7.5049e-01	2.4431e+00	1.4064e-02	6.5772e-02	1.8100e-01	1.8865e-01
15.30	2.1035e+01	7.4298e-01	2.4358e+00	1.3866e-02	6.3985e-02	1.8250e-01	1.9211e-01
15.40	2.0912e+01	7.3565e-01	2.4284e+00	1.3673e-02	6.2598e-02	1.8352e-01	1.9456e-01
15.50	2.0790e+01	7.2846e-01	2.4210e+00	1.3487e-02	6.1452e-02	1.8423e-01	1.9638e-01
15.60	2.0670e+01	7.2139e-01	2.4135e+00	1.3306e-02	6.0462e-02	1.8471e-01	1.9778e-01
15.70	2.0551e+01	7.1442e-01	2.4059e+00	1.3130e-02	5.9578e-02	1.8505e-01	1.9888e-01
15.80	2.0434e+01	7.0755e-01	2.3982e+00	1.2959e-02	5.8794e-02	1.8529e-01	1.9974e-01
15.90	2.0317e+01	7.0074e-01	2.3904e+00	1.2793e-02	5.8014e-02	1.8545e-01	2.0041e-01
16.00	2.0201e+01	6.9402e-01	2.3825e+00	1.2630e-02	5.7302e-02	1.8557e-01	2.0091e-01
16.10	2.0086e+01	6.8737e-01	2.3745e+00	1.2470e-02	5.6622e-02	1.8565e-01	2.0126e-01
16.20	1.9972e+01	6.8078e-01	2.3664e+00	1.2312e-02	5.5968e-02	1.8572e-01	2.0146e-01
16.30	1.9859e+01	6.7426e-01	2.3582e+00	1.2157e-02	5.5334e-02	1.8578e-01	2.0152e-01
16.40	1.9746e+01	6.6778e-01	2.3500e+00	1.2004e-02	5.4715e-02	1.8584e-01	2.0145e-01
16.50	1.9634e+01	6.6136e-01	2.3416e+00	1.1852e-02	5.4108e-02	1.8589e-01	2.0125e-01
16.60	1.9523e+01	6.5498e-01	2.3333e+00	1.1703e-02	5.3509e-02	1.8595e-01	2.0092e-01
16.70	1.9412e+01	6.4863e-01	2.3248e+00	1.1554e-02	5.2913e-02	1.8602e-01	2.0047e-01
16.80	1.9302e+01	6.4232e-01	2.3164e+00	1.1380e-02	5.2304e-02	1.8611e-01	1.9989e-01
16.90	1.9193e+01	6.3605e-01	2.3077e+00	1.1204e-02	5.1707e-02	1.8618e-01	1.9925e-01
17.00	1.9084e+01	6.2977e-01	2.2991e+00	1.1054e-02	5.1103e-02	1.8623e-01	1.9851e-01
17.10	1.8977e+01	6.2351e-01	2.2905e+00	1.0909e-02	5.0508e-02	1.8625e-01	1.9766e-01
17.20	1.8870e+01	6.1727e-01	2.2819e+00	1.0769e-02	4.9923e-02	1.8625e-01	1.9671e-01
17.30	1.8764e+01	6.1105e-01	2.2733e+00	1.0633e-02	4.9347e-02	1.8623e-01	1.9569e-01
17.40	1.8659e+01	6.0486e-01	2.2647e+00	1.0505e-02	4.8781e-02	1.8617e-01	1.9458e-01
17.50	1.8555e+01	5.9872e-01	2.2561e+00	1.0387e-02	4.8226e-02	1.8610e-01	1.9341e-01
17.60	1.8451e+01	5.9270e-01	2.2475e+00	1.0292e-02	4.7685e-02	1.8599e-01	1.9218e-01
17.70	1.8348e+01	5.8570e-01	2.2376e+00	1.0196e-02	4.7030e-02	1.8566e-01	1.9095e-01
17.80	1.8245e+01	5.7744e-01	2.2277e+00	1.0034e-02	4.6119e-02	1.8506e-01	1.8937e-01
17.90	1.8145e+01	5.6937e-01	2.2184e+00	9.8721e-03	4.5231e-02	1.8456e-01	1.8797e-01
18.00	1.8045e+01	5.6153e-01	2.2095e+00	9.7126e-03	4.4376e-02	1.8410e-01	1.8654e-01
18.10	1.7947e+01	5.5397e-01	2.2008e+00	9.5564e-03	4.3571e-02	1.8365e-01	1.8509e-01
18.20	1.7850e+01	5.4663e-01	2.1923e+00	9.4042e-03	4.2809e-02	1.8321e-01	1.8360e-01
18.30	1.7755e+01	5.3948e-01	2.1840e+00	9.2563e-03	4.2083e-02	1.8276e-01	1.8206e-01
18.40	1.7660e+01	5.3252e-01	2.1758e+00	9.1127e-03	4.1390e-02	1.8231e-01	1.8048e-01
18.50	1.7566e+01	5.2570e-01	2.1678e+00	8.9731e-03	4.0725e-02	1.8185e-01	1.7888e-01
18.60	1.7473e+01	5.1903e-01	2.1598e+00	8.8376e-03	4.0083e-02	1.8137e-01	1.7724e-01
18.70	1.7382e+01	5.1248e-01	2.1520e+00	8.7058e-03	3.9464e-02	1.8088e-01	1.7559e-01
18.80	1.7291e+01	5.0604e-01	2.1443e+00	8.5776e-03	3.8862e-02	1.8038e-01	1.7391e-01
18.90	1.7201e+01	4.9969e-01	2.1367e+00	8.4529e-03	3.8276e-02	1.7986e-01	1.7222e-01
19.00	1.7113e+01	4.9324e-01	2.1292e+00	8.3380e-03	3.7702e-02	1.7930e-01	1.7050e-01
19.10	1.7025e+01	4.8701e-01	2.1218e+00	8.2246e-03	3.7144e-02	1.7874e-01	1.6876e-01
19.20	1.6939e+01	4.8086e-01	2.1144e+00	8.1088e-03	3.6590e-02	1.7818e-01	1.6701e-01
19.30	1.6853e+01	4.7480e-01	2.1072e+00	7.9937e-03	3.6044e-02	1.7763e-01	1.6526e-01
19.40	1.6769e+01	4.6882e-01	2.1000e+00	7.8799e-03	3.5507e-02	1.7707e-01	1.6349e-01
19.50	1.6685e+01	4.6293e-01	2.0929e+00	7.7672e-03	3.4979e-02	1.7652e-01	1.6169e-01
19.60	1.6602e+01	4.5712e-01	2.0858e+00	7.6548e-03	3.4456e-02	1.7598e-01	1.5980e-01
19.70	1.6518e+01	4.5138e-01	2.0787e+00	7.5406e-03	3.3937e-02	1.7546e-01	1.5740e-01
19.80	1.6403e+01	4.4566e-01	2.0715e+00	7.4328e-03	3.3395e-02	1.7480e-01	1.5545e-01
19.90	1.6315e+01	4.4006e-01	2.0645e+00	7.3480e-03	3.2873e-02	1.7414e-01	1.5434e-01

Table A.2. Ionization cross section in \AA^2 unit by BEB calculation.

electron energy (eV)	ionization	electron energy (eV)	ionization	electron energy (eV)	ionization
8.8850e+00	0.0000e+00	1.4248e+01	9.0249e-01	2.2848e+01	2.0053e+00
8.9693e+00	0.0000e+00	1.4383e+01	9.2374e-01	2.3065e+01	2.0269e+00
9.0544e+00	0.0000e+00	1.4520e+01	9.4491e-01	2.3283e+01	2.0482e+00
9.1403e+00	0.0000e+00	1.4657e+01	9.6600e-01	2.3504e+01	2.0694e+00
9.2271e+00	0.0000e+00	1.4796e+01	9.8700e-01	2.3727e+01	2.0904e+00
9.3146e+00	0.0000e+00	1.4937e+01	1.0079e+00	2.3953e+01	2.1111e+00
9.4030e+00	3.3158e-03	1.5079e+01	1.0288e+00	2.4180e+01	2.1317e+00
9.4923e+00	1.9847e-02	1.5222e+01	1.0495e+00	2.4409e+01	2.1521e+00
9.5823e+00	3.6746e-02	1.5366e+01	1.0701e+00	2.4641e+01	2.1722e+00
9.6733e+00	5.3996e-02	1.5512e+01	1.0906e+00	2.4875e+01	2.1922e+00
9.7651e+00	7.1579e-02	1.5659e+01	1.1111e+00	2.5111e+01	2.2119e+00
9.8577e+00	8.9480e-02	1.5808e+01	1.1314e+00	2.5349e+01	2.2314e+00
9.9513e+00	1.0768e-01	1.5958e+01	1.1516e+00	2.5590e+01	2.2507e+00
1.0046e+01	1.2617e-01	1.6109e+01	1.1716e+00	2.5833e+01	2.2698e+00
1.0141e+01	1.4493e-01	1.6262e+01	1.1916e+00	2.6078e+01	2.2886e+00
1.0237e+01	1.6395e-01	1.6416e+01	1.2114e+00	2.6325e+01	2.3072e+00
1.0334e+01	1.8321e-01	1.6572e+01	1.2311e+00	2.6575e+01	2.3256e+00
1.0433e+01	2.0269e-01	1.6729e+01	1.2506e+00	2.6827e+01	2.3438e+00
1.0532e+01	2.2240e-01	1.6888e+01	1.2701e+00	2.7082e+01	2.3617e+00
1.0631e+01	2.4230e-01	1.7048e+01	1.2894e+00	2.7339e+01	2.3794e+00
1.0732e+01	2.6239e-01	1.7210e+01	1.3085e+00	2.7598e+01	2.3969e+00
1.0834e+01	2.8266e-01	1.7374e+01	1.3275e+00	2.7860e+01	2.4141e+00
1.0937e+01	3.0310e-01	1.7538e+01	1.3464e+00	2.8124e+01	2.4311e+00
1.1041e+01	3.2368e-01	1.7705e+01	1.3688e+00	2.8391e+01	2.4479e+00
1.1146e+01	3.4441e-01	1.7873e+01	1.3935e+00	2.8661e+01	2.4644e+00
1.1251e+01	3.6527e-01	1.8043e+01	1.4183e+00	2.8933e+01	2.4807e+00
1.1358e+01	3.8625e-01	1.8214e+01	1.4429e+00	2.9207e+01	2.4967e+00
1.1466e+01	4.0734e-01	1.8387e+01	1.4676e+00	2.9485e+01	2.5125e+00
1.1575e+01	4.2853e-01	1.8561e+01	1.4922e+00	2.9764e+01	2.5280e+00
1.1685e+01	4.4981e-01	1.8737e+01	1.5167e+00	3.0047e+01	2.5433e+00
1.1795e+01	4.7116e-01	1.8915e+01	1.5411e+00	3.0332e+01	2.5584e+00
1.1907e+01	4.9259e-01	1.9094e+01	1.5655e+00	3.0620e+01	2.5732e+00
1.2020e+01	5.1408e-01	1.9276e+01	1.5898e+00	3.0910e+01	2.5878e+00
1.2134e+01	5.3562e-01	1.9459e+01	1.6140e+00	3.1204e+01	2.6021e+00
1.2250e+01	5.5721e-01	1.9643e+01	1.6381e+00	3.1500e+01	2.6161e+00
1.2366e+01	5.7883e-01	1.9830e+01	1.6621e+00	3.1799e+01	2.6300e+00
1.2483e+01	6.0048e-01	2.0018e+01	1.6859e+00	3.2100e+01	2.6435e+00
1.2602e+01	6.2215e-01	2.0208e+01	1.7097e+00	3.2405e+01	2.6569e+00
1.2721e+01	6.4383e-01	2.0400e+01	1.7333e+00	3.2713e+01	2.6699e+00
1.2842e+01	6.6552e-01	2.0593e+01	1.7568e+00	3.3023e+01	2.6828e+00
1.2964e+01	6.8721e-01	2.0789e+01	1.7802e+00	3.3336e+01	2.6953e+00
1.3087e+01	7.0888e-01	2.0986e+01	1.8034e+00	3.3653e+01	2.7077e+00
1.3211e+01	7.3054e-01	2.1185e+01	1.8265e+00	3.3972e+01	2.7197e+00
1.3336e+01	7.5218e-01	2.1386e+01	1.8494e+00	3.4294e+01	2.7316e+00
1.3463e+01	7.7379e-01	2.1589e+01	1.8722e+00	3.4620e+01	2.7432e+00
1.3591e+01	7.9536e-01	2.1794e+01	1.8948e+00	3.4948e+01	2.7545e+00
1.3720e+01	8.1689e-01	2.2001e+01	1.9173e+00	3.5280e+01	2.7656e+00
1.3850e+01	8.3838e-01	2.2209e+01	1.9395e+00	3.5615e+01	2.7764e+00
1.3981e+01	8.5981e-01	2.2420e+01	1.9616e+00	3.5953e+01	2.7870e+00
1.4114e+01	8.8118e-01	2.2633e+01	1.9836e+00	3.6294e+01	2.7974e+00

Table A.2. Ionization cross section in \AA^2 unit by BEB calculation (cont).

electron energy (eV)	ionization	electron energy (eV)	ionization	electron energy (eV)	ionization
3.6638e+01	2.8075e+00	5.8753e+01	3.0189e+00	9.4216e+01	2.7813e+00
3.6986e+01	2.8173e+00	5.9311e+01	3.0178e+00	9.5110e+01	2.7735e+00
3.7337e+01	2.8269e+00	5.9873e+01	3.0166e+00	9.6012e+01	2.7656e+00
3.7691e+01	2.8363e+00	6.0442e+01	3.0152e+00	9.6923e+01	2.7576e+00
3.8049e+01	2.8454e+00	6.1015e+01	3.0136e+00	9.7843e+01	2.7495e+00
3.8410e+01	2.8543e+00	6.1594e+01	3.0118e+00	9.8772e+01	2.7413e+00
3.8775e+01	2.8629e+00	6.2179e+01	3.0099e+00	9.9709e+01	2.7331e+00
3.9143e+01	2.8713e+00	6.2769e+01	3.0078e+00	1.0066e+02	2.7248e+00
3.9514e+01	2.8794e+00	6.3364e+01	3.0055e+00	1.0161e+02	2.7163e+00
3.9889e+01	2.8873e+00	6.3966e+01	3.0030e+00	1.0257e+02	2.7079e+00
4.0268e+01	2.8950e+00	6.4573e+01	3.0004e+00	1.0355e+02	2.6993e+00
4.0650e+01	2.9024e+00	6.5185e+01	2.9976e+00	1.0453e+02	2.6907e+00
4.1035e+01	2.9096e+00	6.5804e+01	2.9947e+00	1.0552e+02	2.6820e+00
4.1425e+01	2.9166e+00	6.6428e+01	2.9916e+00	1.0652e+02	2.6732e+00
4.1818e+01	2.9233e+00	6.7059e+01	2.9884e+00	1.0753e+02	2.6643e+00
4.2215e+01	2.9298e+00	6.7695e+01	2.9849e+00	1.0856e+02	2.6554e+00
4.2615e+01	2.9360e+00	6.8338e+01	2.9814e+00	1.0959e+02	2.6464e+00
4.3020e+01	2.9420e+00	6.8986e+01	2.9777e+00	1.1063e+02	2.6374e+00
4.3428e+01	2.9478e+00	6.9641e+01	2.9738e+00	1.1168e+02	2.6283e+00
4.3840e+01	2.9534e+00	7.0302e+01	2.9698e+00	1.1274e+02	2.6191e+00
4.4256e+01	2.9587e+00	7.0969e+01	2.9656e+00	1.1380e+02	2.6099e+00
4.4676e+01	2.9638e+00	7.1642e+01	2.9613e+00	1.1488e+02	2.6006e+00
4.5100e+01	2.9687e+00	7.2322e+01	2.9568e+00	1.1598e+02	2.5912e+00
4.5528e+01	2.9733e+00	7.3008e+01	2.9522e+00	1.1708e+02	2.5818e+00
4.5960e+01	2.9778e+00	7.3701e+01	2.9475e+00	1.1819e+02	2.5723e+00
4.6396e+01	2.9820e+00	7.4401e+01	2.9426e+00	1.1931e+02	2.5628e+00
4.6837e+01	2.9859e+00	7.5107e+01	2.9376e+00	1.2044e+02	2.5533e+00
4.7281e+01	2.9897e+00	7.5819e+01	2.9325e+00	1.2158e+02	2.5437e+00
4.7730e+01	2.9932e+00	7.6539e+01	2.9272e+00	1.2274e+02	2.5340e+00
4.8183e+01	2.9966e+00	7.7265e+01	2.9218e+00	1.2390e+02	2.5243e+00
4.8640e+01	2.9997e+00	7.7998e+01	2.9162e+00	1.2508e+02	2.5145e+00
4.9101e+01	3.0026e+00	7.8739e+01	2.9106e+00	1.2626e+02	2.5047e+00
4.9567e+01	3.0052e+00	7.9486e+01	2.9048e+00	1.2746e+02	2.4949e+00
5.0038e+01	3.0077e+00	8.0240e+01	2.8989e+00	1.2867e+02	2.4850e+00
5.0513e+01	3.0100e+00	8.1002e+01	2.8928e+00	1.2989e+02	2.4751e+00
5.0992e+01	3.0120e+00	8.1770e+01	2.8867e+00	1.3113e+02	2.4651e+00
5.1476e+01	3.0139e+00	8.2546e+01	2.8804e+00	1.3237e+02	2.4552e+00
5.1964e+01	3.0155e+00	8.3330e+01	2.8740e+00	1.3363e+02	2.4451e+00
5.2458e+01	3.0169e+00	8.4120e+01	2.8675e+00	1.3489e+02	2.4351e+00
5.2955e+01	3.0182e+00	8.4919e+01	2.8609e+00	1.3617e+02	2.4250e+00
5.3458e+01	3.0192e+00	8.5724e+01	2.8542e+00	1.3747e+02	2.4148e+00
5.3965e+01	3.0200e+00	8.6538e+01	2.8474e+00	1.3877e+02	2.4047e+00
5.4477e+01	3.0207e+00	8.7359e+01	2.8404e+00	1.4009e+02	2.3945e+00
5.4994e+01	3.0211e+00	8.8188e+01	2.8334e+00	1.4142e+02	2.3843e+00
5.5516e+01	3.0214e+00	8.9025e+01	2.8263e+00	1.4276e+02	2.3740e+00
5.6043e+01	3.0214e+00	8.9870e+01	2.8190e+00	1.4411e+02	2.3637e+00
5.6575e+01	3.0213e+00	9.0723e+01	2.8117e+00	1.4548e+02	2.3534e+00
5.7112e+01	3.0210e+00	9.1584e+01	2.8042e+00	1.4686e+02	2.3431e+00
5.7654e+01	3.0205e+00	9.2453e+01	2.7967e+00	1.4826e+02	2.3328e+00
5.8201e+01	3.0198e+00	9.3330e+01	2.7890e+00	1.4966e+02	2.3224e+00

Table A.2. Ionization cross section in \AA^2 unit by BEB calculation (cont).

electron energy (eV)	ionization	electron energy (eV)	ionization	electron energy (eV)	ionization
1.5108e+02	2.3120e+00	2.4228e+02	1.7910e+00	3.8851e+02	1.3243e+00
1.5252e+02	2.3016e+00	2.4457e+02	1.7809e+00	3.9220e+02	1.3158e+00
1.5396e+02	2.2912e+00	2.4690e+02	1.7709e+00	3.9592e+02	1.3074e+00
1.5543e+02	2.2808e+00	2.4924e+02	1.7609e+00	3.9968e+02	1.2990e+00
1.5690e+02	2.2703e+00	2.5160e+02	1.7509e+00	4.0347e+02	1.2906e+00
1.5839e+02	2.2599e+00	2.5399e+02	1.7410e+00	4.0730e+02	1.2823e+00
1.5989e+02	2.2494e+00	2.5640e+02	1.7310e+00	4.1116e+02	1.2740e+00
1.6141e+02	2.2389e+00	2.5884e+02	1.7211e+00	4.1507e+02	1.2658e+00
1.6294e+02	2.2284e+00	2.6129e+02	1.7113e+00	4.1900e+02	1.2576e+00
1.6449e+02	2.2179e+00	2.6377e+02	1.7014e+00	4.2298e+02	1.2494e+00
1.6605e+02	2.2074e+00	2.6627e+02	1.6916e+00	4.2699e+02	1.2413e+00
1.6762e+02	2.1968e+00	2.6880e+02	1.6818e+00	4.3105e+02	1.2332e+00
1.6922e+02	2.1863e+00	2.7135e+02	1.6720e+00	4.3514e+02	1.2251e+00
1.7082e+02	2.1758e+00	2.7393e+02	1.6623e+00	4.3927e+02	1.2171e+00
1.7244e+02	2.1652e+00	2.7653e+02	1.6525e+00	4.4343e+02	1.2091e+00
1.7408e+02	2.1547e+00	2.7915e+02	1.6429e+00	4.4764e+02	1.2012e+00
1.7573e+02	2.1441e+00	2.8180e+02	1.6332e+00	4.5189e+02	1.1932e+00
1.7740e+02	2.1336e+00	2.8447e+02	1.6236e+00	4.5618e+02	1.1854e+00
1.7908e+02	2.1230e+00	2.8717e+02	1.6140e+00	4.6051e+02	1.1775e+00
1.8078e+02	2.1125e+00	2.8990e+02	1.6044e+00	4.6488e+02	1.1698e+00
1.8250e+02	2.1019e+00	2.9265e+02	1.5949e+00	4.6929e+02	1.1620e+00
1.8423e+02	2.0914e+00	2.9543e+02	1.5854e+00	4.7374e+02	1.1543e+00
1.8598e+02	2.0808e+00	2.9823e+02	1.5759e+00	4.7824e+02	1.1466e+00
1.8774e+02	2.0703e+00	3.0106e+02	1.5665e+00	4.8278e+02	1.1390e+00
1.8952e+02	2.0597e+00	3.0392e+02	1.5571e+00	4.8736e+02	1.1314e+00
1.9132e+02	2.0492e+00	3.0680e+02	1.5477e+00	4.9198e+02	1.1238e+00
1.9314e+02	2.0387e+00	3.0971e+02	1.5383e+00	4.9665e+02	1.1163e+00
1.9497e+02	2.0281e+00	3.1265e+02	1.5290e+00	5.0136e+02	1.1088e+00
1.9682e+02	2.0176e+00	3.1562e+02	1.5197e+00	5.0612e+02	1.1013e+00
1.9869e+02	2.0071e+00	3.1861e+02	1.5105e+00	5.1093e+02	1.0939e+00
2.0057e+02	1.9966e+00	3.2164e+02	1.5013e+00	5.1577e+02	1.0866e+00
2.0248e+02	1.9861e+00	3.2469e+02	1.4921e+00	5.2067e+02	1.0792e+00
2.0440e+02	1.9756e+00	3.2777e+02	1.4829e+00	5.2561e+02	1.0719e+00
2.0634e+02	1.9652e+00	3.3088e+02	1.4738e+00	5.3060e+02	1.0647e+00
2.0830e+02	1.9547e+00	3.3402e+02	1.4648e+00	5.3563e+02	1.0574e+00
2.1027e+02	1.9443e+00	3.3719e+02	1.4557e+00	5.4072e+02	1.0503e+00
2.1227e+02	1.9340e+00	3.4039e+02	1.4467e+00	5.4585e+02	1.0431e+00
2.1428e+02	1.9236e+00	3.4362e+02	1.4377e+00	5.5103e+02	1.0360e+00
2.1632e+02	1.9133e+00	3.4688e+02	1.4288e+00	5.5626e+02	1.0289e+00
2.1837e+02	1.9030e+00	3.5017e+02	1.4199e+00	5.6153e+02	1.0219e+00
2.2044e+02	1.8927e+00	3.5350e+02	1.4110e+00	5.6686e+02	1.0149e+00
2.2253e+02	1.8825e+00	3.5685e+02	1.4022e+00	5.7224e+02	1.0080e+00
2.2464e+02	1.8722e+00	3.6024e+02	1.3934e+00	5.7767e+02	1.0010e+00
2.2678e+02	1.8620e+00	3.6366e+02	1.3846e+00	5.8315e+02	9.9415e-01
2.2893e+02	1.8518e+00	3.6711e+02	1.3759e+00	5.8869e+02	9.8731e-01
2.3110e+02	1.8416e+00	3.7059e+02	1.3672e+00	5.9427e+02	9.8051e-01
2.3329e+02	1.8314e+00	3.7411e+02	1.3585e+00	5.9991e+02	9.7374e-01
2.3551e+02	1.8213e+00	3.7766e+02	1.3499e+00	6.0561e+02	9.6701e-01
2.3774e+02	1.8112e+00	3.8124e+02	1.3413e+00	6.1135e+02	9.6032e-01
2.4000e+02	1.8011e+00	3.8486e+02	1.3328e+00	6.1716e+02	9.5366e-01