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Erratum

Dielectronic recombination data for dynamic finite-density plasmas

II. The oxygen isoelectronic sequence

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Mistakes in an earlier publication (Zatsarinny et al. 2003) have been discovered and are corrected below (in boldface). The first is a missing exponent in an equation, the second is some wrong fitting coefficients for several ions, the third and fourth are an incorrect caption and an incorrect label in a figure, and the fifth is an inaccuracy in high-temperature radiative recombination rate coefficients.

In Eq. (4), we inadvertently omitted an exponent of $1 + b$ in the second parenthesized term in the square brackets. The correct equation should read

$$\alpha_{\mathrm{RR}}(T) = a\left[\sqrt{T/T_0}\left(1 + \sqrt{T/T_0}\right)^{1-b} \left(1 + \sqrt{T/T_1}\right)^{\mathbf{1+b}} \right]^{-1}. \quad (4)$$

The original RR fitting coefficients are correct and are applicable to this corrected Eq. (4).

In Table 1, some of the DR fitting coefficients are incorrect due to initially undetected human errors in the postprocessing of the atomic data. As a result, we have refitted our archived totals for the entire sequence using up to seven terms in the summation of Eq. (3). We have retabulated in Table 1 only results for those ions that showed significant differences, which occur at lower temperatures, from those of our initial fitting procedure. We emphasize that these few errors were not in the atomic physics calculations, which are accurate for the entire sequence i.e. the *adf09* files are unchanged, but rather only in the fitting algorithm.

In Fig. 4, there were two typographical errors. First, in Fig. 4a, the caption states that the rate coefficients shown are for $\Delta n_{\mathrm{c}} = 1$ DR, that is, from all $3lnl'$ states; in fact, what has been plotted is DR only to the $3lnl'$ $n > 3$ states. This does not affect our conclusion that even though $\Delta n_{\mathrm{c}} = 0$ DR does not scale smoothly along an isoelectronic sequence, $\Delta n_{\mathrm{c}} > 0$ DR does. Second, in Fig. 4b, the labels for Na^{3+} and Al^{5+} were erroneously interchanged and should be reversed.

Finally, we have discovered that the electron energy range over which our photoionization cross sections were calculated was accidentally restricted. Thus, the extrapolation of the cross sections to higher energies before convolution with a Maxwellian distribution to form RR rate coefficients was applied at much lower energies than usual and before it was accurate to do so. Consequently, the $T^{-3/2}$ asymptotic behaviour of the RR rate coefficient comes in at too low a temperature. Thus, our fitting coefficients for RR should not be used for $T \gtrsim 3 Z^2$ eV, where Z is the residual charge of the electron target. This limited temperature region of validity also is the case for our earlier RR work on the C-like (Zatsarinny et al. 2004a) and Ne-like (Zatsarinny et al. 2004b) sequences.

References

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Zatsarinny, O., Gorczyca, T. W., Korista, K., Badnell, N. R., & Savin, D. W. 2004a, A&A, 417, 1173
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Table 1. Fitting coefficients of Eq. (3) for dielectronic recombination of selected O-like ions forming F-like systems. The c_i are in units of 10^{-11} cm^3 s^{-1} eV$^{1.5}$ and the E_i are in eV.

Ion	c_1	c_2	c_3	c_4	c_5	c_6	c_7
F$^+$	2.477E–04	6.521E–04	7.721E–04	1.145E–03	4.402E–01	7.618E+01	0.000E–00
Ne^{2+}	2.384E–03	1.006E–02	8.976E–02	2.101E+02	7.042E+01	9.848E+04	0.000E–00
Na^{3+}	2.494E–02	1.495E–01	4.287E–01	2.434E+02	3.934E+02	4.538E+01	0.000E–00
Mg^{4+}	1.834E–01	5.515E–01	2.111E–00	3.910E+02	3.351E+02	6.948E+02	0.000E–00
Cl^{9+}	1.427E–00	1.984E+01	5.555E+01	1.129E+03	1.504E+03	1.818E+04	1.258E+02
Sc^{13+}	4.931E–00	4.044E+01	1.882E+02	2.432E+03	7.351E+03	5.733E+04	0.000E–00
Fe^{18+}	1.626E+01	9.272E+01	4.454E+02	4.386E+03	2.696E+04	1.214E+05	0.000E–00
	E_1	E_2	E_3	E_4	E_5	E_6	E_7
F$^+$	3.840E–04	9.953E–03	3.821E–02	1.210E+00	1.117E+01	2.051E+01	0.000E–00
Ne^{2+}	3.946E–03	4.096E–02	1.276E+00	2.421E+01	4.104E+01	4.030E+04	0.000E–00
Na^{3+}	2.939E–02	2.435E–01	1.233E+00	2.471E+01	4.803E+01	1.047E+02	0.000E–00
Mg^{4+}	4.648E–02	1.536E–01	1.499E+00	1.487E+01	3.282E+01	9.626E+01	0.000E–00
Cl^{9+}	2.847E–01	1.123E+00	3.782E+00	3.433E+01	8.233E+01	2.596E+02	6.626E+02
Sc^{13+}	6.568E–01	2.496E+00	8.755E+00	5.681E+01	2.117E+02	4.637E+02	0.000E–00
Fe^{18+}	3.018E–01	3.065E+00	1.876E+01	9.290E+01	3.891E+02	7.799E+02	0.000E–00