

which can be readily seen from the above equations. Also see Osterbrock (1989), page 33, equation (2.30). The solution for  $x_0$  is:

$$\frac{1}{x_0} = 1 + \sum_{j=1}^Z \left( \prod_{i=0}^{j-1} \frac{P_i}{R_i} \right) ,$$

from which the solution for higher ions readily follows.