## Appendix

## Electron screening model prediction.

The ground state of nitrogen (Z=7) is  $1s^22s^22p^3$ . Using the model, predicts the ionization energy of a nitrogen atom.

The nucleus has 7 protons. The 4 inner electrons provide full shielding, and the other two electrons in the 2p state provide half-shielding:

$$Z_{\text{eff}} = 7 - 4 - 2(1/2) = 2$$

the energy ionization is therefore

$$E = \frac{2^2}{2^2} 13.6 \text{ eV} = 13.6 \text{ eV}$$