Aufbau Principle and Electron Configurations

I. Each element is “built up” systematically from the previous by the addition of both one proton (to the nucleus) and one electron

II. The electron is placed in the lowest energy orbital available (maximum 2 electrons/orbital)

Examples:

H: \(1s^1\)
He: \(1s^2\)
Li: \(1s^22s^1\)\[He\] \(2s^1\)
Be: \(1s^22s^2\)\[He\] \(2s^2\)
B: \(1s^22s^22p^1\)\[He\] \(2s^22p^1\)
C: \(1s^22s^22p^2\)\[He\] \(2s^22p^2\)
N: \(1s^22s^22p^3\)\[He\] \(2s^22p^3\)
O: \(1s^22s^22p^4\)\[He\] \(2s^22p^4\)
F: \(1s^22s^22p^5\)\[He\] \(2s^22p^5\)
Ne: \(1s^22s^22p^6\)\[He\] \(2s^22p^6\)
Na: \(1s^22s^22p^13s^1\)\[Ne\] \(3s^1\)
Ca: \(1s^22s^22p^13s^2\)\[Ne\] \(3s^2\)
Al: \(1s^22s^22p^13s^13p^1\)\[Ne\] \(3s^22p^1\)