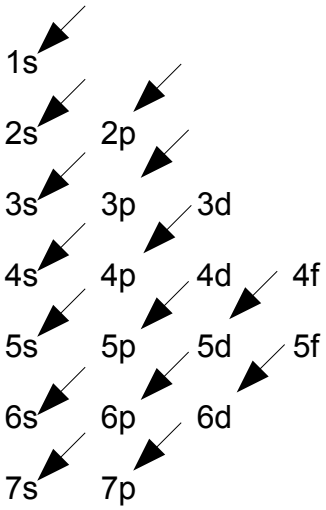
Electron Configuration

Keep in mind that your configuration should always satisfy these rules :

•The number of electrons in an atom is the atomic number(Z) or the amount of protons of the atom.
•The number of electrons in an ion of an atom is the atomic number (Z) minus the ion charge.
•Lowest Energy levels are filled first. (Hund's Rule)
•Within an orbital there can only be two electrons and each should have opposing spins (Pauli
•Exclusion Principle).

To fill each orbital follow this order:

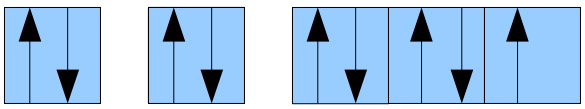


Each orbital can hold:
S orbital = up to 2 electrons
P orbital = up to 6 electrons
D orbital = up to 10 electrons
F orbital = up to 15 electrons

•Start by writing all of the orbitals that exist in each level.
•Remember that the p orbital starts at the 2nd energy level and the d orbital starts at the 3rd energy level.
•After numbering the orbitals in the order as shown to the left, draw arrows down from the right of the number and connect the orbitals that fall within the same diagonal line.
•This will be the order that you write each of the orbitals.

•ex. Flourine = F

•Flourine has an atomic number of 9 (atomic number = number of electrons).



$1s^2 2s^2 2p^5$

•Notice that Flourine is a Halogen (Group 7) which wants to fill its last orbital to satisfy the octet rule.

Electron Configuration of an Ion

•1. Find out the atomic number of an atom and subtract it from the ion charge. This will be new amount of electrons you will be finding the configuration of.

Example for: Mn^{+2}

•If you compare this configuration with that of the expanded form of manganese then you can see that 2 electrons were taken away from the d orbital signifying a Mn ion with a 2+ charge.
•Atomic # Mn – ion charge =
25 - (+2) = 23 electrons

$[Mn^{+2}]1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^3$

Condensed Electron Configuration:

1. Look at the element you want to find the configuration for and find the Noble gas that comes directly before it (group 8).
2. Place the noble gas in brackets before you continue the rest of your configuration.
3. Continue the configuration with the next s orbital that follows the noble gas.

Example for Manganese:

$[Ar]4s^2 3d^5$

This is the expanded electron configuration for Manganese:

$[Mn]1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^5$