

Ion Charges Notes

Ionic Charges

Recall that a full shell = 8 electrons

In ionic bonding, atoms form ions that either gain or lose electrons to gain a full shell

Charge depends on how many valence electrons you have

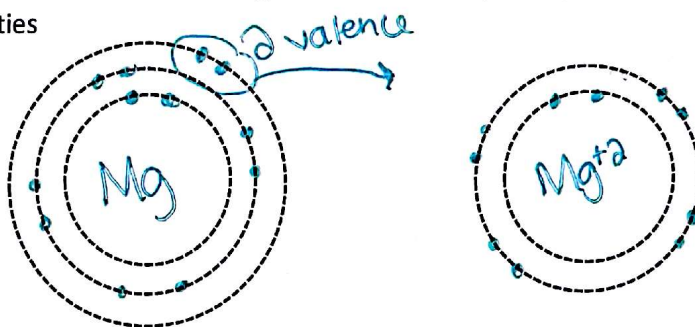
Metals

Metals will lose electrons

Loss of all valence electrons (and outer shell)

For example, magnesium has two valence electrons

It is easier to lose two electrons than gain 6 electrons, especially since metals do not have large electronegativities



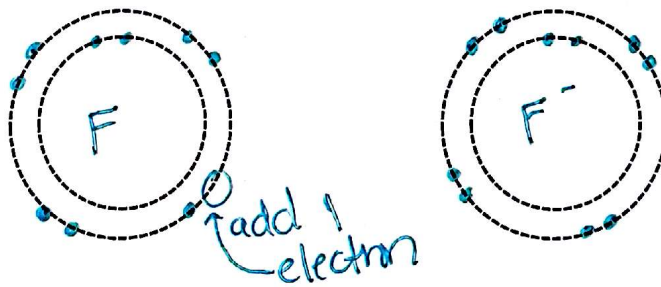
Nonmetals

Nonmetals will gain electrons

Add valence electrons until they reach 8

For example, Fluorine has 7 valence electrons

Since Fluorine (and other nonmetals) have high electronegativities, it is easier to gain 1 electron than have to give up 7



Ion charges based on location

Again, it all depends on how many valence electrons and how close to a full shell (8 electrons) the atom is

| Group # | 1A | 2A | 3A | 4A | 5A | 6A | 7A | 8A |
|-------------------|--------|--------|--------|----------------|--------|--------|--------|----|
| # valence | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| e- lost or gained | lose 1 | lose 2 | lose 3 | lose or gain 4 | gain 3 | gain 2 | gain 1 | / |
| ion charge | +1 | +2 | +3 | +4 | -3 | -2 | -1 | 0 |