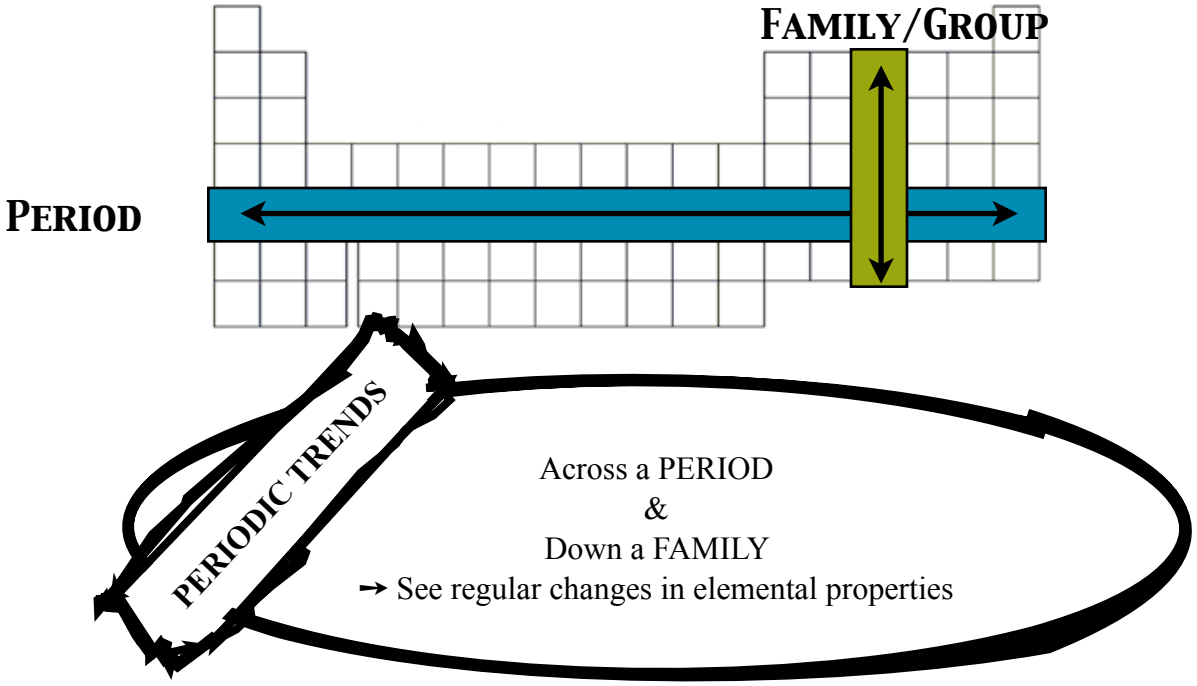
6.2 PERIODIC TRENDS



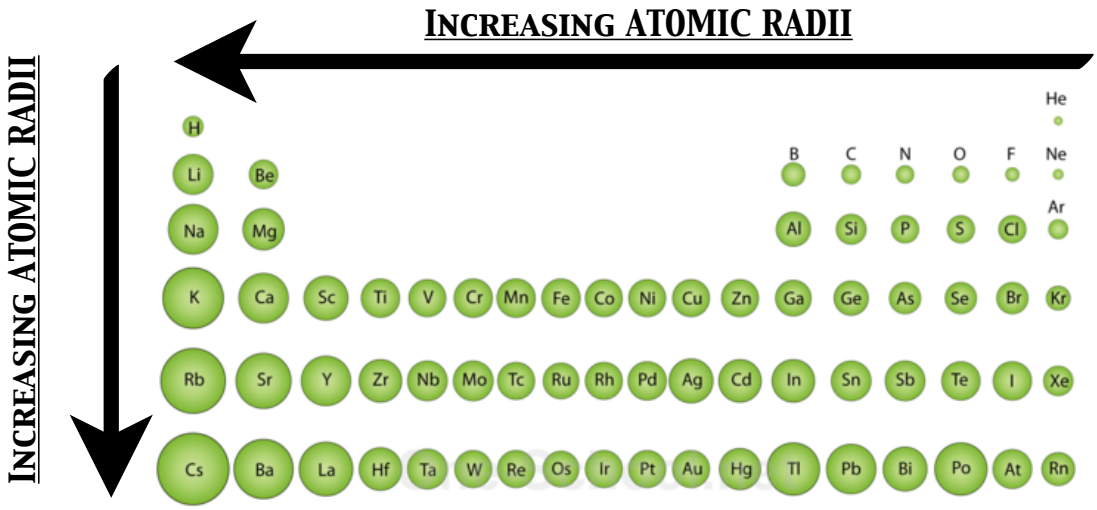
ATOMIC SIZE

Definite Size Vs. Estimated Size	
Definite Size	Estimated Size
Definite boundaries of an object Eg. Marbles	Possible boundaries with approximations Eg. E^- clouds where e^- spend 90% of their time

ATOMIC SIZE TREND

1. As enr levels (n) ⬆ ⟶ e^- are further from the nucleus ⟶ atom size ⬆

2. When e^- feel nucleus pull (**effective nuclear charge**) ⟶ e^- cloud is closer to nucleus ⟶ atom size ⬇



Example:

Li ($1s^2 2s^1$)
Na ($1s^2 2s^2 2p^6 3s^1$)
K ($1s^2 2s^2 2p^6 3s^2 3p^6 4s^1$)
Rb ($1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^1$)
Cs (
Fr (

IONIC SIZE TREND

-Ionic radii of -ve ions > their neutral atomic radii.
➡Ionic radii of -ve ions ⬆ as the -ve charge ⬆.

-Ionic radii of +ve ions < their neutral atomic radii.
➡Ionic radii of +ve ions ⬇ as the +ve charge ⬇.

Example:

Same # of e^-; diff # of p^+ and n^o

$N^{3-} > O^{2-} > F^- > Ne > Na^+ > Mg^{2+} > Al^{3+}$

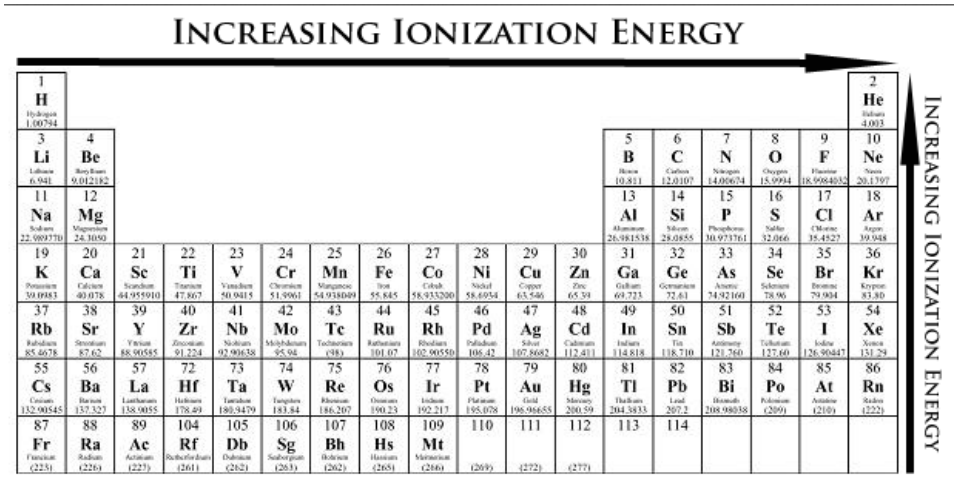
IONIZATION ENERGY TREND

Ionization Energy (IE): the minimum enr required to remove an e^- from a (g) atom or ion

Large atom:
Nucleus has a ⬇hold on e^-
⬇ IE

Small atom:
Nucleus has a ⬆ hold on e^-
⬆ IE

Metals:
⬇IE
Lose e^-

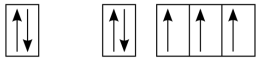


Non-metals:
⬆IE
Gain e^-

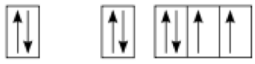
Exceptions to IONIZATION ENERGY TREND

Nitrogen & Oxygen

N: larger atom, but ⬆IE



O: smaller atom, but ⬇IE



ELECTRONEGATIVITY TREND

Electronegativity: Relative ability of a bonded atom to attract shared e^- to itself