Coulombic Attraction

Force of attraction between ⊕ and ⊖ charges

Force of repulsion between like charges

$F = k \frac{q_1 q_2}{r^2}$ ← charges magnitude

↑ distance

★ distance

Shorter distance = stronger attraction/repulsion

★ Higher magnitude of charges = stronger attraction/repulsion

Ex) K^+ Cl^- Al^{3+} N^{3-}

Weaker attraction Stronger attraction

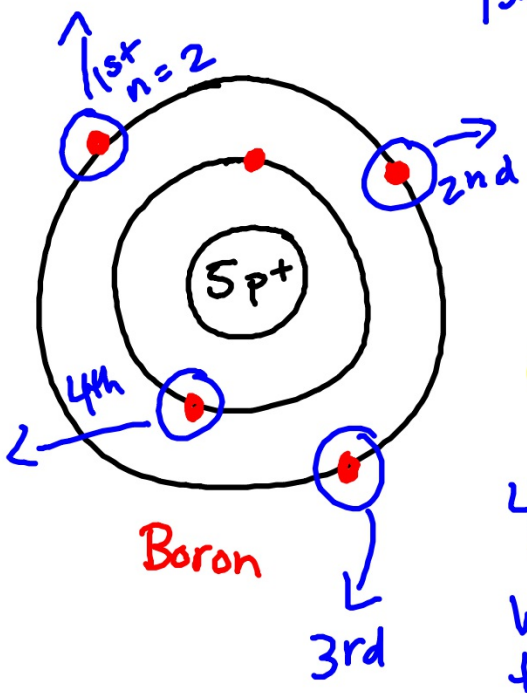
Ionization Energy (I.E.)

- E needed to remove an e^- from an atom

- Stronger attraction btwn nucleus & e^-
  = harder to remove = higher I.E.

- more E levels = weaker attraction = lower I.E.

- Same E level, but more p^+ = Stronger effective nuclear charge
  = Stronger attraction = higher I.E.



1st I.E. - E needed to remove 1st e⁻

5p+ : 5e⁻

2nd I.E. - E needed to remove 2nd e⁻

5p+ : 4e⁻

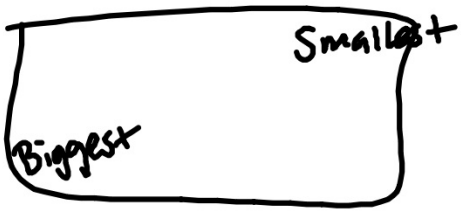
higher than I.E.,

3rd I.E. > 2nd I.E. > 1st I.E

4th I.E. >>>>>> 3rd I.E.

Way closer to nucleus b/c in lower E level

Atomic Radius



- More E levels = greater distance = larger atomic radius
- If same E level = more p+ = more Z_{eff}
  - = Stronger attraction btwn nucleus + valence e⁻
  - = e⁻ pulled in closer to nucleus
  - = Smaller atomic radius.

Electronegativity

- less E levels = shorter distance btwn nucleus & bonding e^- = higher electroneg.

- If same E level = more p^+ = stronger Z_{eff} = more attraction btwn nucleus & bonding e^- = higher electronegativity