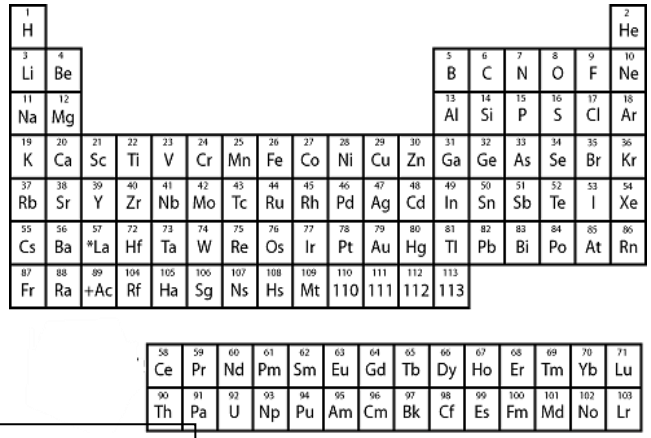
GROUPS = columns
= amount valence electrons

PERIODS = rows
= amount energy levels

IONIZATION ENERGY
ELECTRON AFFINITY
ELECTRON NEGATIVITY



IONIZATION ENERGY (IE)

- kJ.mol^{-1}
- metals = ↓ IE
- non-metals = ↑ IE
- ↑ e^- gravitational force → ↑ IE
- <u>4 Factors:</u>
  - Charge
  - Atomic radius
  - Amount core electrons (repulsion and defence effect)
  - Repulsion of electrons in the same orbital
- Deviations
- Valence e^- ≈ ↓ IE
- Core electrons ≈ ↑ IE

ATOMIC RADIUS

- ↑ energy levels → ↑ atomic radius
- ↑ atom number → ↓ atomic radius
- ↓ atomic radius → ↑ gravitational forces between atoms (metals)
- ↑ molecule → ↑ gravitational forces between molecules (non-metals)
- Single molecules = weak bindings (group 15 – 18)
- Network structures = very strong bindings (group 4)
- Metal rosters = strong and dense bindings
- ↑ gravitational forces → ↑ melting point, boiling point, density

ELECTRON AFFINITY (EA)

- metals = ↓ EA
- non-metals = ↑ EA
- ↑ e^- gravitational forces → ↑ EA
- ↑ atom number → ↑ EA
- ↑ atomic radius → ↓ EA
- Δ H < 0
  - Energy released
  - e^- easily absorbed
  - non-metals (except noble gases)
- Δ H > 0
  - Energy absorbed
  - e^- not easily absorbed
  - metals and anions

ELECTRON NEGATIVITY (EN)

- metals = ↓ EN
- non-metals = ↑ EN
- ↑ e^- gravitational force → ↑ EN
- ↑ atom number → ↑ EN
- ↑ atomic radius → ↓ EN
- Δ EN = 0 → covalent non-polar
- 0 < Δ EN < 1,9 → covalent polar
- Δ EN > 1,9 → ionic