Chem 131 Lecture

9/5/18
Section 1325

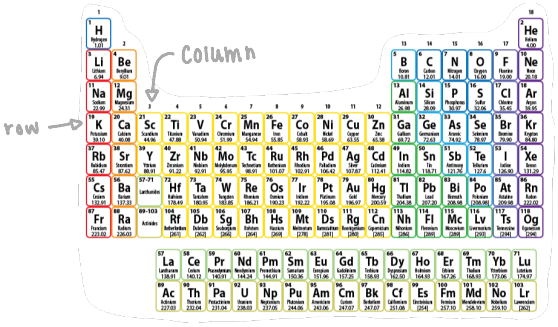
chapter five

- Main Ideas
- examples
- Very important

Periodic Table

- Set up by Mendeleev in 1869
- Grouped in terms of chemical properties
- Column (Group) → up & down
- Row (Period) → left to right

ex: Test Q → List elements in ____ group



Phases of elements

- @ room temp
- solids (s)
  - ↳ almost all elements
- liquids (l)
  - ex: Hg & Br
- Gases (g)
  - ex: H, N, O, F, Cl
- Noble Gases ← (Group 8A)

The Elements

- Most are metals
- Metals
  - ↳ shiny, can hammer into sheets
  - ↳ tend to loose e^- - want $8e^-$
  - ↳ Alkali Metals (1A)
    - ex: Na, Li, K, etc
    - Hydrogen not included
    - reactive w/ H_2O & air
    - lose $1e^-$
  - ↳ Alkali Earth Metals (2A)
    - form Alkaline solutions w/
    - lose $2e^-$
- Metalloid → "kind of a metal"
  - ↳ the "staircase" that seperates the sides
  - ex: Boron
  - ↳ Mixed properties, semi conductors
  - ↳ either gain or lose e^-
- Nonmetals
  - ↳ variable properties
  - ↳ poor conductors of heat/electricity
  - ↳ gain e^-
- Halogens (7A)
  - ↳ reactive nonmetals
  - ↳ gain $1e^-$
- Noble Gases (8A)
  - ↳ gas @ room temp
  - ↳ unreactive → have $8e^-$, stable
  - ↳ Octet Rule Rules!
- Transition Metals
  - ↳ Middle of Table

Diatomic Molecules

- bonded to 2 things

ex: F_2, Cl_2, Br_2, I_2

- To remember: BrINClHOF
  - Br → Bromine
  - I → Iodine
  - N → Nitrogen
  - Cl → Chlorine
  - H → Hydrogen
  - O → oxygen
  - F → Flourine

Bonding

- elements become together & form ionic compounds/ molecules to achieve a full octet
- Ionic
  - ↳ Metal | Nonmetal
  - ↳ Give & recieve relationship
  - ↳ electrostatic connection [w/ a positive & negative charge]
  - ↳ pulling apart not breaking apart
  - ↳ positive charge after: cation → metal
  - ↳ negative charge after: anion → nonmetal

ex: $Na \cdot \; :\ddot{\underset{..}{Cl}}:$ (LOST, GAIN) → $Na^+ \; [:\ddot{\underset{..}{Cl}}:]^-$ [NaCl → ionic compound]

  - ↳ Clarification: NH_4^+ (ammonium)
    - A polyatomic ion is one unit
- Covalent
  - ↳ Nonmetal | Nonmetal
  - ↳ form a molecule → share the e^-

ex: $:\ddot{\underset{..}{Cl}}\cdot + :\ddot{\underset{..}{Cl}}\cdot \rightarrow :\ddot{\underset{..}{Cl}} - \ddot{\underset{..}{Cl}}:$ [Cl_2]

↳ 2 shared e^-

  - ↳ A physical break occurs

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