

History

1. Democritus - atoms exist - just a thought
2. Lavoisier - Law of conservation of mass
mass before rxn = mass after rxn
3. Proust - Law of definite proportions
When you separate H₂O you will ALWAYS get two H's and one O!
4. Dalton - Atomic Theory
 1. everything made of small indivisibles
 2. atoms of same element = same
 3. atoms of different element = different
 4. law of definite proportions = all H₂O**MARBLE!**
5. Thomson - Discovered the electron
Plum Pudding Model
Negative Plums in Positive pudding
6. Rutherford - Discovered nucleus
Gold Foil Experiment
**Nucleus must be SMALL
Dense and POSITIVE**
7. Borh - e⁻'s orbit nucleus
Like planets around the sun
ORBITS!
Lowest energy = close to the nucleus
Higher energy as you move away
8. Chadwick - discovered neutron

Quantum Mechanics

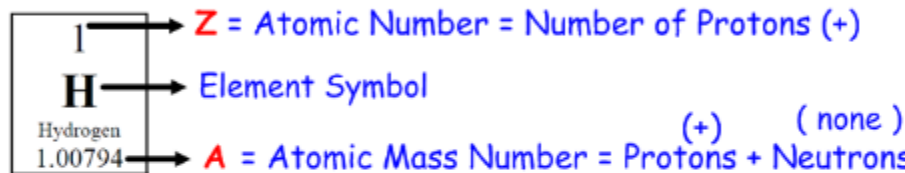
Electrons are found in **ORBITALS**

1. deBroglie - e⁻'s are particles AND waves
2. Heisenberg's Uncertainty Principle -
we cannot know the location and momentum of an e⁻ AT THE SAME TIME!
Orbitals - regions of space where there is a HIGH PROBABILITY of finding 0, 1 or 2 e⁻'s
S,P,D,F shapes for orbitals - how electrons fill the shapes = electron configuration!

Aufbau's principle - e⁻'s reside in low energy state closest to the nucleus

Hund's Rule - Only one e⁻ in an orbital at a time they will only double up if they have to

Atomic Structure



Atoms - neutral so Protons = Electrons
(+) (e⁻)

Ion - Charged Particle so Protons ≠ Electrons
Cation = (+) lost electrons
Anion = (-) gained electrons

Isotopes - same element but different mass
most common mass on the Periodic Table

Unit:4 Atoms

How Atoms Produce Light

1. e⁻'s reside at **GROUND STATE** which is closest to the nucleus b/c it takes less energy.
2. add energy - thermal, electrical, or mechanical
3. e⁻'s **JUMP** to higher orbitals or **EXCITED STATE** with **MORE** energy
This **defies** the **AUFBAU PRINCIPLE**
4. e⁻'s can't stay up forever, so they fall back down and release a **PHOTON!**
The different energy photons look like different colored light in the flame test!