Isotopes

Atoms can commonly have more than one ratio of protons and neutrons that are stable. The equations below will help calculate the number of each subatomic particle in an isotope of an element

Atomic Number = # Protons (p^+) [*Type of Atom*]

 # Protons (p^+) = # Electrons (e^-) [*Atoms Neutral*]

Mass Number = # Protons + # Neutrons [*Isotope Mass*]

 # Neutrons (n^o) = Mass Number - Atomic Number

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Periodic Blocks

Periodic Blocks based on element types

Block	Groups / Elements
Representative Metals	Groups 1A (1), 2A (2) + Al (13)
Transition Metals	Groups 1B (3) – 10B (12) + In, Tl, Sn, Pb
Metalloids	B, Si, Ge, As, Sb, Te, At
Non-Metals	Groups 4A (14) (*C only*) – 8A (18)
Rare Earth Elements	Bottom (*Lanthanides and Actinides*)

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Subatomic Particles

Counting Valence Electrons (e^-) [*Representative Groups*]

Valence Electrons are based on group on the table

Group	Name	Val e^-	Group		Val e^-
1A (1)	Alkali Metals	1	5A (15)	Pnictogens	5
2A (2)	Alkali Earth Metals	2	6A (16)	Chalcogens	6
3A (13)	Earth Metals	3	7A (17)	Halogens	7
4A (14)	Carbon Group	4	8A (18)	Noble Gases	8

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Subatomic Particles

Ion Charge

Charge of an ion is based on the group on the periodic table

Cation (+ ion): Ions formed due to gaining electrons (*metals*)
Anion (- ion): Ions formed due to losing electrons (*non-metals*)

Group	Val e^-	Charge	Group	Val e^-	Charge	Group	Val e^-	Charge
1A (1)	1	1+	**3A (13)**	3	3+	**6A (16)**	6	2-
2A (2)	2	2+	**4A (14)**	4	4+ / 4-	**7A (17)**	7	1-
1B – 10B (3 – 12)	2 (Varies)	Varies	**5A (15)**	5	3-	**8A (18)**	8	No Charge

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