

Dot Notation and Ion Formation Organizer

Important vocabulary:

Valence electron – An electron in the outermost energy level. An electron available for bonding.

Octet – A group of eight valence electrons

Noble gas configuration – Valence electrons equal to that of a noble gas. For most elements, a Noble gas configuration is an octet. For a few small elements (H, Li, Be), it is two electrons, the configuration of helium ($1s^2$)

Cation – a positively-charged ion formed when a metal loses an electron

Anion – a negatively-charged ion formed when a nonmetal gains an electron

Metals lose electrons, forming *cations*

Nonmetals gain electrons, forming *anions*

	Group 1	Group 2	Group 13	Group 14	Group 15	Group 16	Group 17	Group 18
Element	Sodium Na	Magnesium Mg	Aluminum Al	Silicon Si	Phosphorus P	Sulfur S	Chlorine Cl	Argon Ar
Valence electrons	1	2	3	4	5	6	7	8
Element dot notation	Na·	·Mg·	·Al·	·Si·	:P·	:S·	:Cl:	:Ar:
Electrons lost or gained	Lose 1 e ⁻	Lose 2 e ⁻	Lose 3 e ⁻	Share to form covalent bonds	Gain 3 e ⁻	Gain 2 e ⁻	Gain 1 e ⁻	Don't gain, lose or share electrons
Ion formed	Na ¹⁺	Mg ²⁺	Al ³⁺	None	P ³⁻	S ²⁻	Cl ¹⁻	None