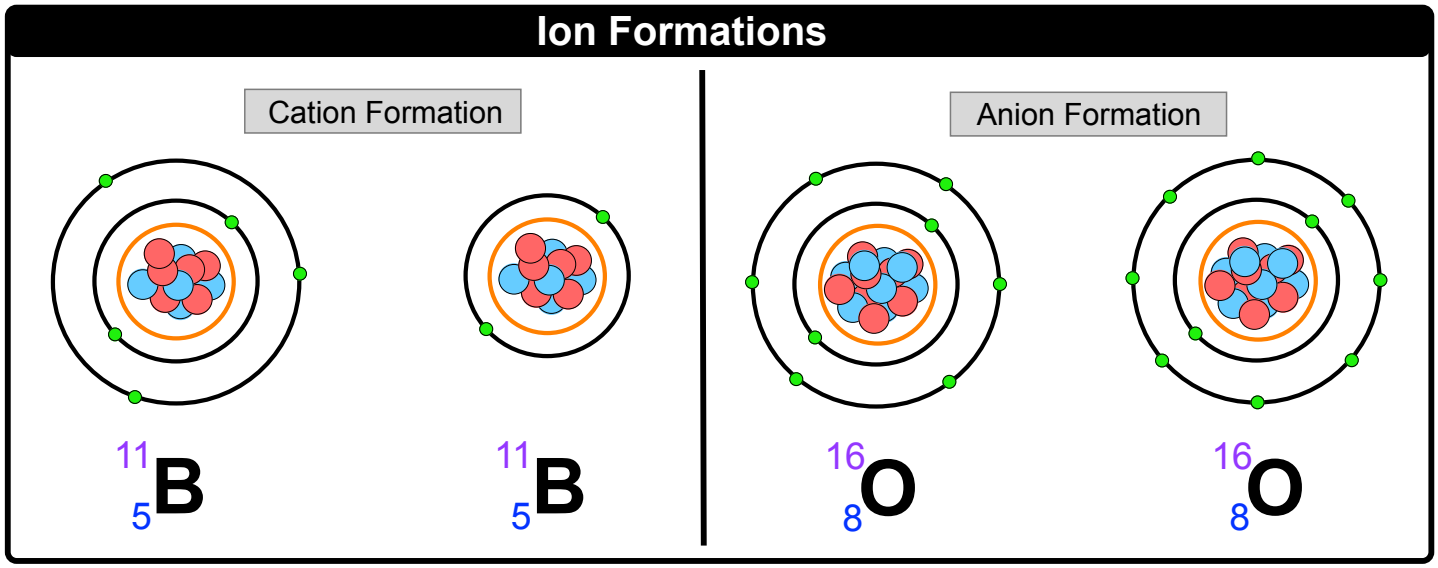
CONCEPT: IONS

- **Ions** are created from the loss or gaining of electrons by elements.
  - □ When an element _____ electrons it becomes a positively charged ion called a *cation.*
  - □ When an element _____ electrons it becomes a negatively charged ion called an *anion.*
    - □ **Isoelectronic**: Elements that have the same number of _____.



EXAMPLE: Determine the number of protons, neutrons, and electrons for the following cation $^{27}_{13}Al^{3+}$.

a) 13,27,13 b) 13,14,16 c) 13,14,10 d) 27,13,13

PRACTICE: Give the correct number of protons, neutrons and electrons for the following isotope: $^{81}_{35}Br^{-}$.

a) 35,35, 81 b) 35,46,36 c) 81,46, 82 d) 35,46,34

PRACTICE: In which pair are the two species **both** isoelectronic and isotopic?

a) $^{40}_{20}Ca^{2+}$ and $^{40}_{18}Ar$

b) $^{23}_{11}Na^{+}$ and $^{24}_{11}Na^{+}$

c) $^{24}_{12}Mg^{2+}$ and $^{25}_{12}Mg$

d) $^{56}_{26}Fe^{2+}$ and $^{57}_{26}Fe^{3+}$

CONCEPT: IONS

PRACTICE: One isotope of a metallic element has a mass number of 65 and 35 neutrons in the nucleus. The cation that this atom forms has 28 electrons. What is the symbol of the cation?

a) ^{65}Zn b) $^{65}Ga^{3+}$ c) $^{65}Zn^{2+}$ d) $^{65}Ni^{2+}$

PRACTICE: Which of the following is the symbol for the ion with a +4 charge, 30 neutrons and 21 electrons?

a) $^{55}Mn^{4+}$ b) $^{51}Cl^{4+}$ c) $^{51}Mn^{4+}$ d) $^{58}Ni^{4+}$

PRACTICE: Fill in the gaps for the following table.

Symbol	Protons	Neutrons	Electrons	Mass Number	Net Charge
Co^{3+}				59	
	34	46	36		
	76	116			2+
	80	120	78		