

Bonding

when 2 or more atoms connect:
get "stuck" together to create
compounds

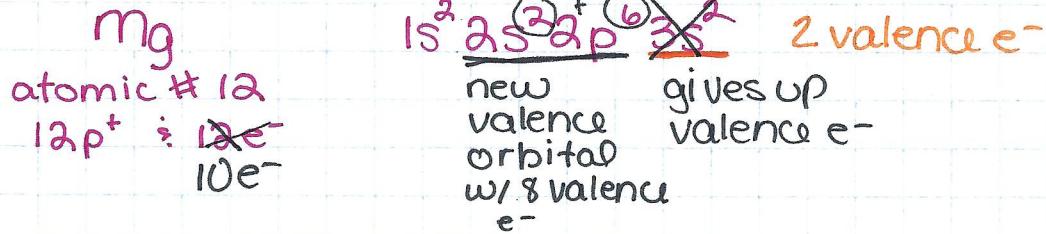
Ionic Bonding - forms b/w a metal &
a nonmetal

- reason of bonding - OCTET RULE

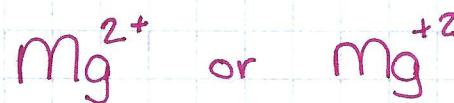
All elements want to have 8 valence e⁻
(full s & p sublevels) - creates stability
(except H & He - want 2 valence e⁻)

Metals - have low ionization energies (easily give up their valence e⁻) & low electronegativities (don't need another atom's e⁻)

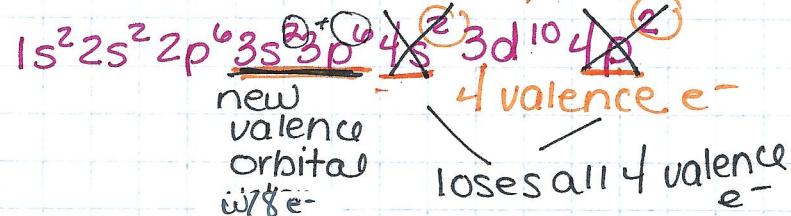
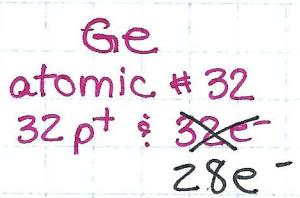
Ex)



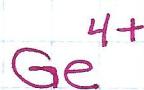
becomes a positively charged ion,
called a cation



never valence e⁻



becomes a cation



①

- Nonmetals
- have high ionization energies & high electronegativities
 - steal valence e^- from metals

Ex)



atomic # 9

$9p^+ \& 9e^-$
 $+ 10e^-$



↑ steal e^-

↑ valence e^-

now has 8 valence e^-

become a negatively charged ion, called an anion.



atomic # 15

$15p^+ \& 15e^-$
 $18e^-$



has 5 valence e^-

steal 3 e^- to be stable
& have 8 valence e^-



Summary

Metals lose valence e^- to become stable by forming + charged cations

Nonmetals steal valence e^- to become stable by forming - charged anions

The Ionic Bond form b/w a cation & an anion

Show the formation of an ionic bond using e⁻ dot diagrams.

use the symbols of the element
up to 8 dots representing its valence e⁻

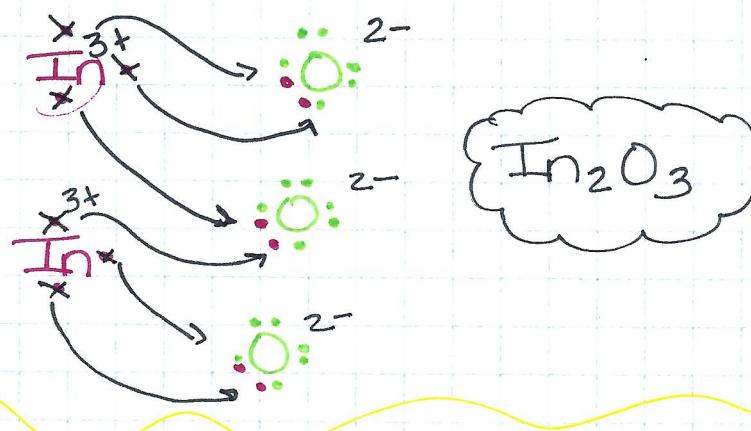
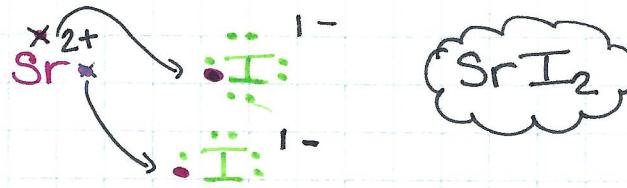
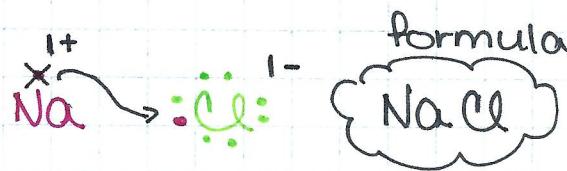
Ex)



Steps

- 1) Draw e⁻ dot diagrams for metal & nonmetal
- 2) Draw arrows to show e⁻'s transferring from metal to the nonmetal
- 3) Write the charges that form
- 4) Write the formula for the new ionic compound

Ex)



Properties of Ionic compounds

- 1) extremely strong bonds
- 2) high melting & boiling points
- 3) hard, crystalline solid
- 4) conduct electricity when molten or dissolved in solution

(3)