Ionic Compound Notes

Warmup

Write the isotope symbol for each of the following:

- An atom with 15 protons and 17 neutrons.
- An atom with 16 protons and 18 electrons.
- An atom with 11 protons and 10 electrons.

Ionic Compound

For ionic compounds - metals form cations and non metals form anions

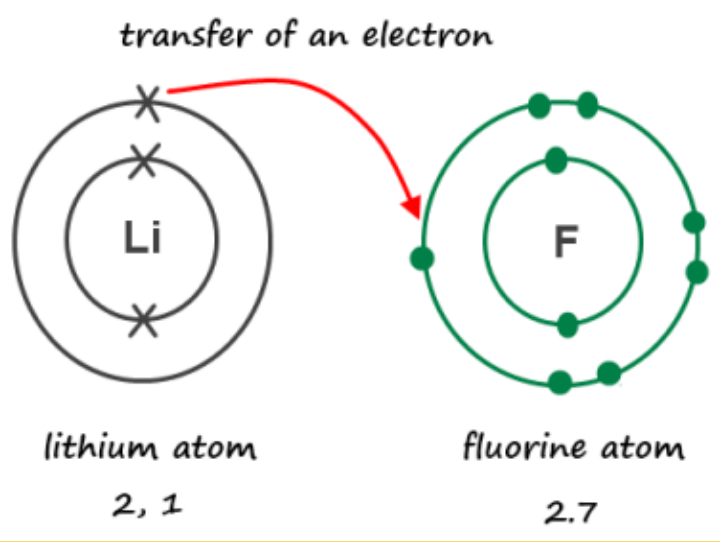
Opposite charges attract and bond

Ionic Bonding

- Metals (cations) lose valence electrons.
- Nonmetals (anions) gain valence electrons.
- As ions, the atoms form an ionic bond.
- Metals lose valence electrons and end up with a full outer shell. Nonmetals gain electrons with the same result.

Example

- Set up one atomic model for an atom of Lithium with the correct number of valence electrons.
- Set up one atomic model for an atom of Fluorine with the correct number of valence electrons.
- Move electrons to form Li^{1+} and F^{1-}
- Draw each model, write down the number of protons and electrons, write out the symbol for each ion and the compound formula.
- Lithium: 3 + and 3 –
- Lithium ion: 3 + and 2–   +1 charge
- Fluorine: 9 + and 9 –
- Fluorine ion: 9+ and 10 –   -1 charge
- Makes LiF compound



Repeat exercise for compounds containing

- Lithium and Chlorine
- Magnesium and Oxygen
- Aluminum and Nitrogen

How would Lithium and Oxygen combine? Discuss and try!

- You need 2 Lithium atoms to combine with 1 Oxygen atom.

Rules forwriting ionic compounds

1. **Cation first!** The cation always goes first when writing out the chemical formula of an ionic compound.
2. **The Rule of Zero Charge**: In an ionic compound, the positive charges on the metal cations and the negative charges on the nonmetal anions sum to 0.
3. **Anion name change:** Change the ending of the anion name to “ide” when naming ionic compounds (unless it’s a polyatomic ion – then it stays the same)

- Monday Homework:
- Read pp 58-61/ Do questions p. 62/6 and 7
- Read pp 63-67/ Do questions p. 67/3,4,6,7

End of Monday ppt

Explain to your neighbor how these elements bond!

- Na and Cl
- K and O

Use your cards to make an ionic compound that has…

1) One cation and 2 anions
2) 2 cations and one anion
3) 3 cations and 2 anions
4) One cation and 3 anions
5) 3 cations and one anion

For each write out the ionic compound formula and name.

NAMING

Naming is easier! In general - change the anion name so that it ends in “ide”. For most nonmetals you keep the first syllable. Oxygen becomes oxide.

Example: NaCl Sodium Chloride

	Li^{+1}	Na^{+1}	Be^{+2}	Mg^{+2}	B^{+3}	Al^{+3}
F^{-1}						
Cl^{-1}		$NaCl$	$BeCl_2$			
O^{-2}	Li_2O				B_2O_3	
S^{-2}						
N^{-3}						
P^{-3}				Mg_3P_2		

	Li^{+1}	Na^{+1}	Be^{+2}	Mg^{+2}	B^{+3}	Al^{+3}
F^{-1}	LiF					
Cl^{-1}		NaCl	$BeCl_2$			
O^{-2}	Li_2O				B_2O_3	
S^{-2}						
N^{-3}						
P^{-3}				Mg_3P_2		

	Ca	Ga	Na	Sr	Al	K
Cl						
P						
S						
Te						
Br						
I						

- Tuesday Homework:
- Read pp 96-99/ Do questions p. 100/1,4-5, and 11
- Read pp 101-105/ Do questions p. 105/1,2,3

End of Tuesday

Polyatomic Ions

Molecular Ions that are made of more than one atom but still have a charge.

Example: NO_3^{-1} = Nitrate

NH_4^{+1} = Ammonium

Polyatomic ions in compounds

When bonding polyatomic ions into ionic compounds treat them like a regular ion with a charge. Use parenthesis if there is more than one.

Example: Mg combines with 2 nitrate ions. Write $Mg(NO_3)_2$

NAMING

Naming is easier! **<u>Do not</u>** change the ending to “ide” if the anion is the polyatomic ion. Just keep it the same.

Example: $NaNO_3$ This is called Sodium Nitrate (not sodium nitrogen oxide!)

Use your cards to make ionic compounds

1) One polyatomic cation and 1 anion
2) 2 cations and one polyatomic anion
3) 3 cations and one polyatomic anion
4) 2 cations and 3 polyatomic anions
5) 3 polyatomic cations and one anion

<u>For each write out the ionic compound formula and name</u>.

Name These Compounds

- $Al_2(C_2O_4)_3$
- $Ba(NO_3)_2$
- NH_4OH
- $NaHCO_3$

Write out the compound formula

- Ammonium carbonate
- Calcium phosphate
- Sodium hydroxide
- Potassium dichromate

Wednesday Homework:

- Read pp 107-109 and pp 111-113
- Handout for ionic bonding practice

Thursday Homework:

- Read pp 114-116
- Handout for bonding practice with transition metals