Do Now ...

Date: January 21, 2014

Obj: Prepare for semester two with overview of lab safety and topics.

Complete **the drawing of the room** of the back of the safety test you picked up at when you entered the classroom.

Include labels!

Wednesday, January 21, 2014

Today:

W-Up: Safety Test, Notes & Practice: Semester B Main Ideas, Quick Quiz

Homework:

Finish Safety Test, Read Pages 187-188

Semester B Topics

You can use notes you take during the presentation on the quick quiz.

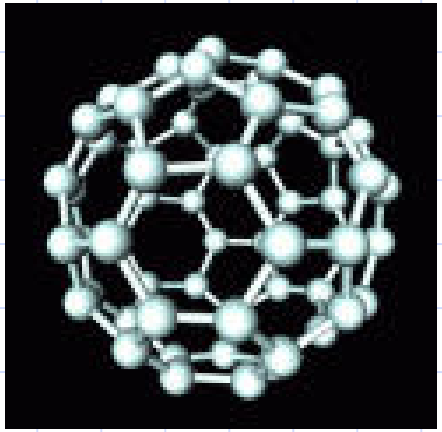
- Chemical Bonding
- States of Matter
- Gases and Molecular Kinetic Theory
- Solutions
- Thermochemistry
- Acids and Bases
- Rates and Equilibrium

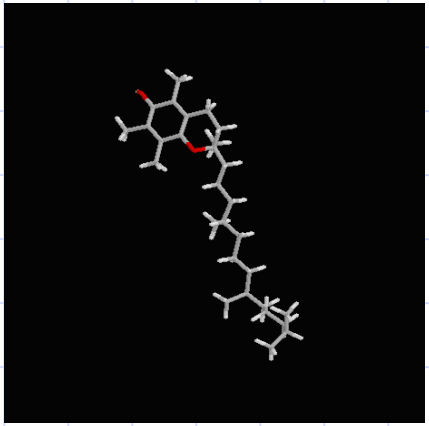
Chemical Bonding

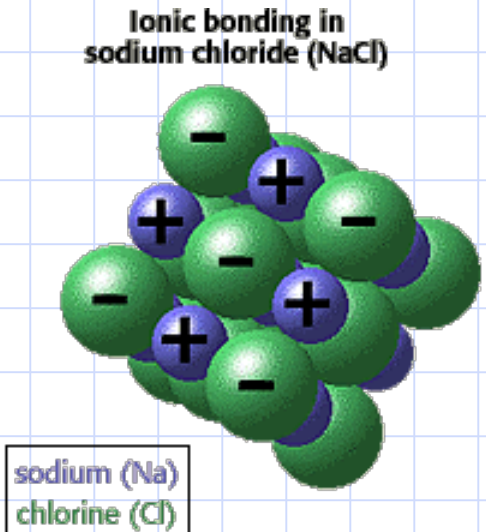
Atoms interact with one another by *transferring* or *sharing* electrons.

The *shape* of a molecule influences its properties.

Carbon has a unique ability to form a variety of compounds.







Gases and Molecular Kinetic Theory

Gas pressure is created when molecules:

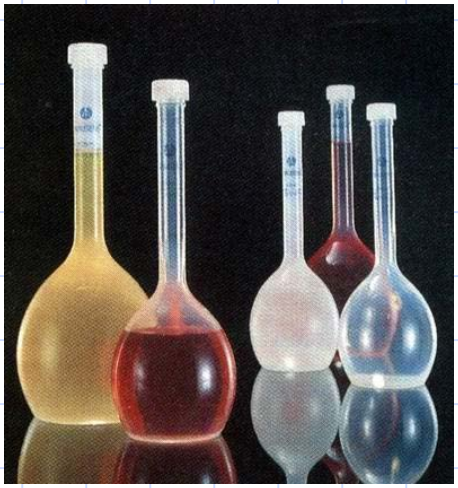
- gain energy, or
- have less space in which to move.

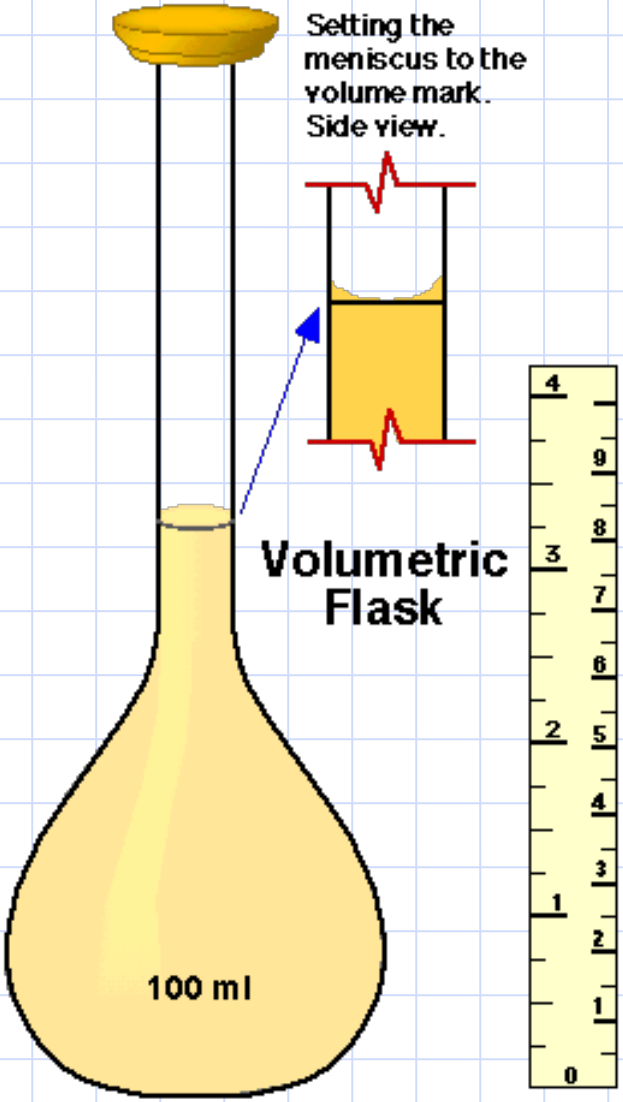
Gas molecules are constantly and randomly moving.

Gas molecules are mostly far apart.

Solutions

Solution concentration can be expressed quantitatively or qualitatively.





Thermodynamics

Exothermic chemical reactions give off heat.

Endothermic reactions take in heat.

Heat energy remains constant in a closed system.

Changes occur to lower energy or create disorder.

Demo: Dollar

Question: What will happen to Mr. B's alcohol soaked dollar when a flame is applied?

Acids and Bases

Acids taste sour, corrosive, conduct electricity, react with metals, and produce hydrogen ions in solution

Bases are bitter, slippery to touch, and conduct electricity, and produce hydroxide ions in solution.

Acids and Bases

pH is a measurement of the acidity of a solution.

A neutralization reaction produces a salt and water.

Quick Quiz (paraphrase question)

What takes place with electrons when atoms form chemical bonds?

Describe what is taking place at the molecular level when a balloon is placed in a very cold environment.

Define exothermic and endothermic. Give an example of each.

What does the H stand for in pH?

You drink all of the water from a plastic bottle. You put the cap on the bottle and tighten it. Then you put the bottle in the refrigerator. An hour later, you notice that the bottle is dented. Why is the bottle dented after being cooled in the refrigerator?

Before being cooled

After being cooled

A. All the molecules of air went out of the bottle.

B. Heat molecules inside the bottle were destroyed.

C. The molecules of air inside the bottle broke down.

D. The molecules of air inside the bottle got closer together.

www.Breslyn.org

- For class notes, PowerPoint presentations (also in PDF), links, practice tests, ...

www.Breslyn.org

- When you are absent check the website for what we did in class.

- Most effective is viewing the class presentation for the day.

Do Now ...

Date: January 22, 2014

Obj: Describe trends on the periodic table.

Copy and identify type of compound:

M + NM = ionic compound
NM + NM = covalent/molecular compound

KCl: _____ SO_3:____ H_2O:____ $FeCl_3$:____

Safety-Quiz

Complete and correct your safety test. Make sure you understand the correct answer for each question.

1. A
2. D
3. A
4. A
5. D
6. C
7. B
8. D
9. B
10. D
11. B
12. A
13. B
14. B
15. A
16. A
17. D
18. C
19. A
20. B
21. A
22. A
23. B

24. Safety equipment labeled on drawing as appropriate for each classroom and/or laboratory.

Thursday, January 22, 2014

Today:

Warm-Up: Chemical Bonding Vocabulary, Notes, Activity: Dot Structures, Electron Configs, and Bond Types

Homework: Finish Activity Sheet

Valence Electrons

1. Draw electron dot structures for Lithium (Li), Magnesium (Mg), Fluorine (F), and Neon (Ne).

   For example, •Na

2. How many valence electrons are represented in the following electron configurations?

   $1s^2 2s^2 2p^6 3s^1$

   $1s^2 2s^2 2p^6 3s^2 3p^6$

3. How can you tell how many valence electrons an atom has?

Class Expectations

Respect others and their property.

Think SAFETY (no eating in class, goggles MUST be worn at all times during labs).

Be on time to class (in your seat before the bell rings)

Be attentive and participate in class.

Limit side conversations.

Bring necessary materials to class every day.

A word about side conversations and cell phones...

...

Grades

Check Edline regularly!!! This is your responsibility.

Your final grade is based on:

- Labs: 20%
- Quizzes: 20%
- Tests: 50%
- Homework & Classwork (includes warm-ups): 10%

Grades: Important Points

- Late homework is not accepted.
- Labs must be made up within one week of an absence.
- It is your responsibility to find out what you missed when you are out!
- Check Edline frequently.

Chemical Bonding

Why do atoms bond?

- Attractions between atoms.
- To lower their energy.
- To become more stable.
- To obtain full outer shell.

Why do atoms bond?

lower energy = more stable

What part of atoms are involved in the bond?

Electrons in the outermost **s** and **p** orbitals are involved in chemical bonds.

Called **Valence Electrons**.

Why are these subatomic particles the most important in chemical bonding?

Types of Bonds

Three main types of bonds:

Ionic, Covalent (or Molecular), & Metallic

How do chemists decide how to classify a compound as ionic, covalent, or metallic?

Ionic Bonds

Metal + Nonmetal = Ionic

Which of the following are ionic compounds?

NaCl

C_2H_6

$CaCO_3$

Ionic Bond Formation

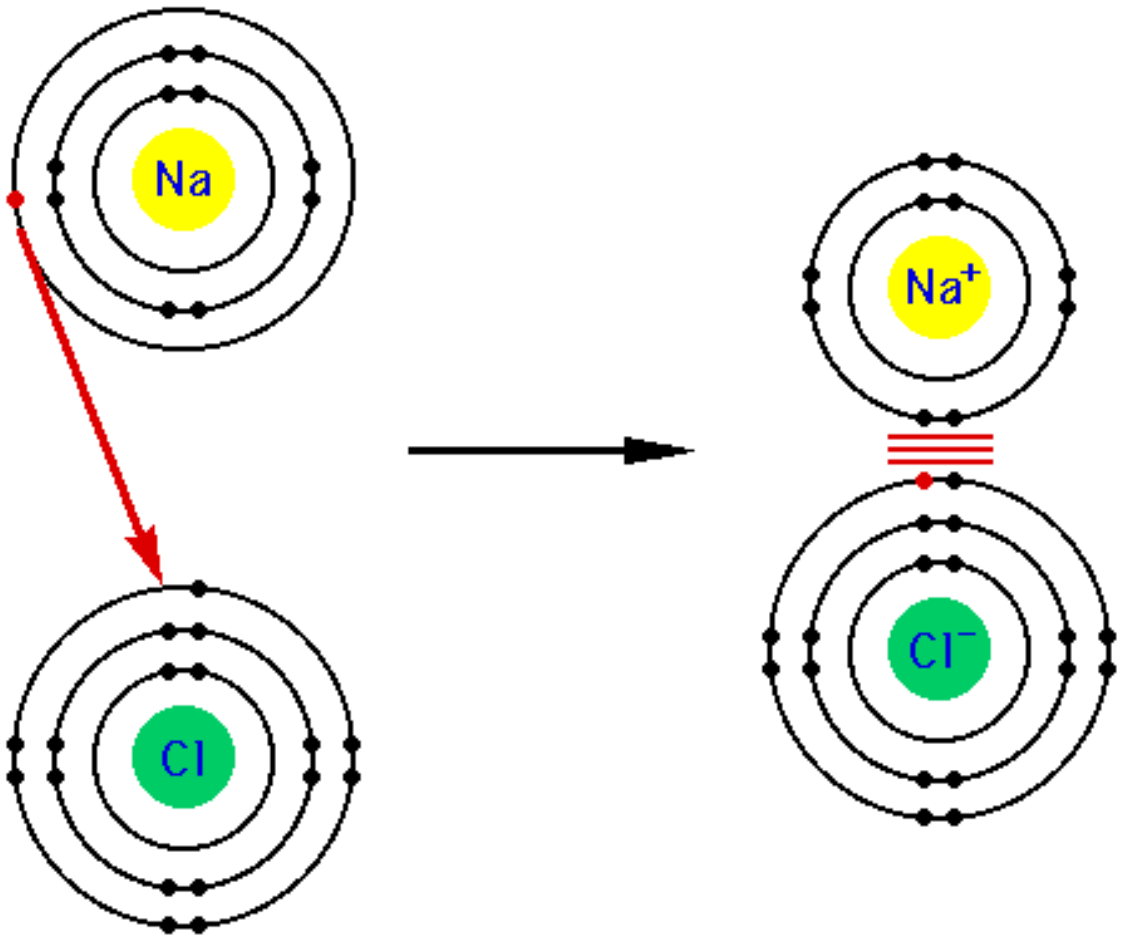


Image from http://www.agen.ufl.edu/~chyn/age2062/lect/lect_02/2_11a.gif

In your own words describe how an ionic bond forms.

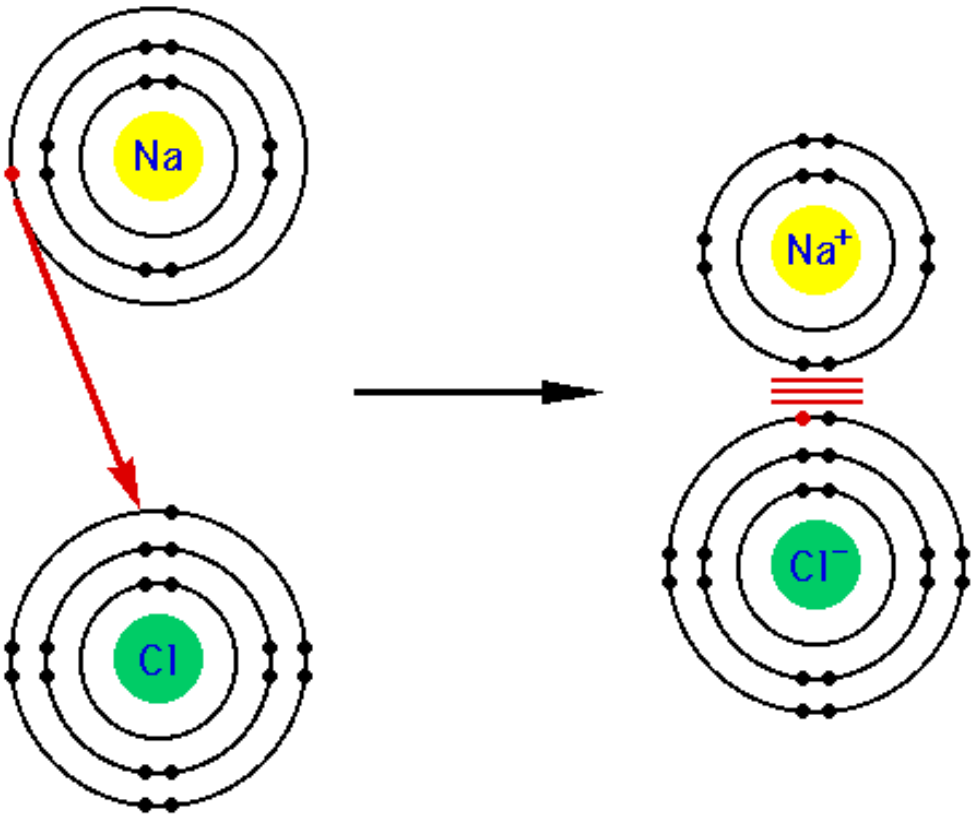


Image from http://www.agen.ufl.edu/~chyn/age2062/lect/lect_02/2_11a.gif

Think about:

electrons b/f & after

mov't of electrons

shells

e- in shells

why the atoms bond

Video of NaCl Bonding

Covalent Bonds

- Atoms SHARE valence electrons.
- NM + NM (or several NM)
- Tend to be weaker than ionic bonds.

Covalent (Molecular) Bonding

NonMetal + NonMetal

Which of the following are covalent compounds?

NaCl	C_2H_6
Block of copper.	H_2O

Why do atoms bond?

- Attractions between atoms.
- To lower their energy.
- To become more stable.
- To obtain an octet.

Why do atoms bond?

lower energy = more stable

What part of atoms are involved in the bond?

Electrons in the outermost **s** and **p** orbitals are involved in chemical bonds.

Called **Valence Electrons**.

Why are these subatomic particles the most important in chemical bonding?

Ionic or Covalent Bonds

- KCl
- NO_2
- PCl_3
- ZnF_2
- CH_4

Ionic Bonding

Describe how an ionic bond forms.

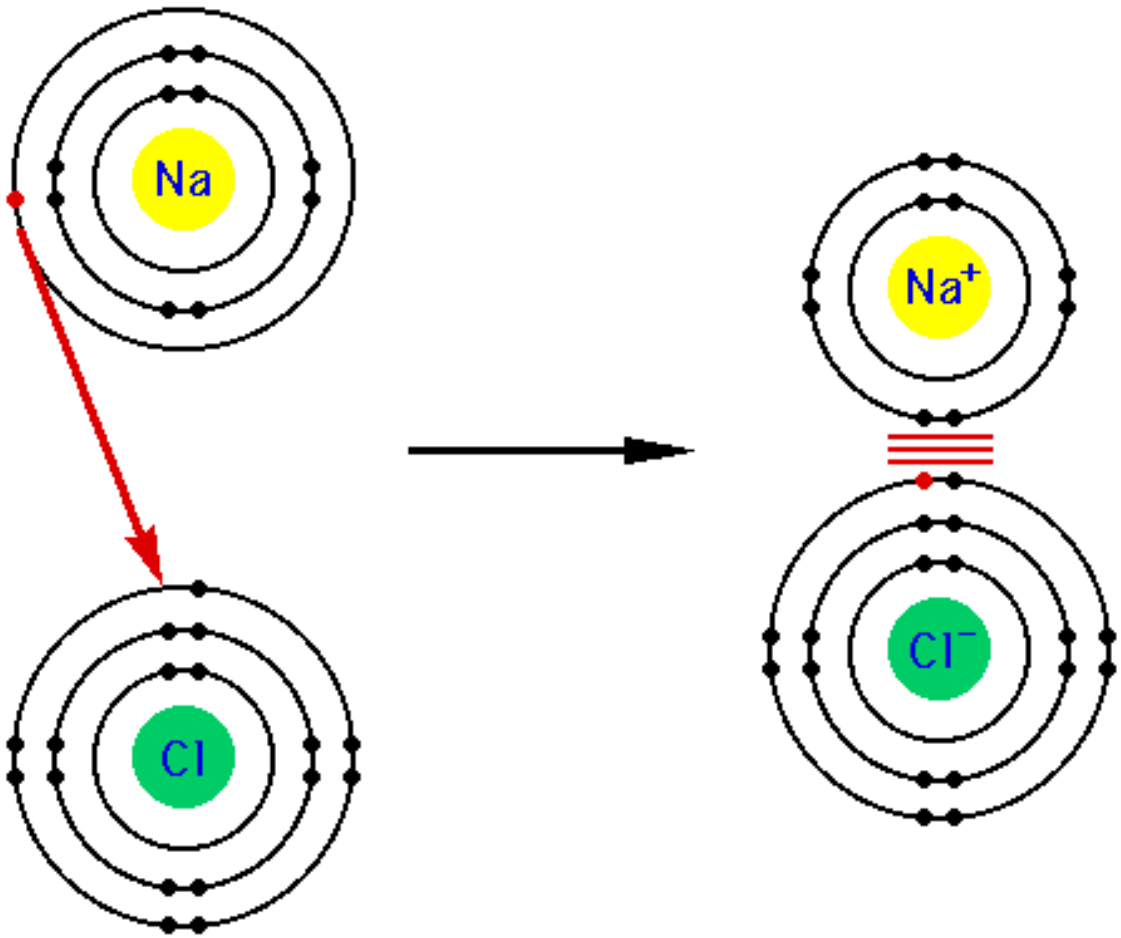


Image from http://www.agen.ufl.edu/~chyn/age2062/lect/lect_02/2_11a.gif

Covalent (Molecular) Bonding

NonMetal + NonMetal

Which of the following are covalent compounds?

$CaSO_4$

Methane (CH_4)

H_3O^+

Do Now …

Date: Friday, January 23rd, 2015

Obj: Describe the three types of chemical bonds.

Copy and identify the type of Chemical Bond:

$CaCl_2$: ____ CH_4: _____ CO_2: _____ Ne: _____

A block of copper: _____ HCl: _____

Friday, January 23rd, 2015

Today:

Warm-Up
Bond Type Activity
Quiz

Homework:
Review page 244 – Table 8.4

Classify as Ionic or Covalent and Name Each Compound

$CaCl_2$	KCl
CH_4	Ne
CO_2	iron (III) chloride
$CaSO_4$	pentane

MCR: Types of Chemical Bonds

Describe the three types of chemical bonds. Give examples of each bond, general properties, behavior of valence electrons, and other important information. Use your concept map to guide your writing.

Activity: Types of Bonds

Activity: Copy the skeleton of the concept map from the board. Expand on each branch.

Be sure to include examples of each, behavior of valence electrons, properties, and other relevant information.

Chapter 14 (p373) & 15 (p392) are helpful. Table 15.5 is also very useful.

MCR: Types of Chemical Bonds

Describe the three types of chemical bonds. Give examples of each bond, general properties, behavior of valence electrons, and other important information. Use your concept map to guide your writing.

Old Content----------

Warm-Up

1. Draw the dot structure for He. Remember, helium has an electron configuration of $1s^2$.

   Draw the dot structure for Ca and Ca^{2+}

1. What are three types of bonds?

2. Draw the electron dot structure for HCl and $MgCl_2$.

Warm-Up

Valence Electrons

State the importance of valence electrons and how they relate to the electron configuration of an atom.

Predict how sodium (Na) and oxygen (O) will bond based on their valence electrons.

Naming Chemical Compounds

Our system for naming is based primarily on whether the compound is ionic or covalent.

Practice

Write the formulas for the following ionic compounds:

lithium chloride magnesium chloride

Iron (II) bromide lead (II) sulfate

Write the names for the following ionic compounds:

$NaCl$ $MgBr_2$ $CaSO_4$ $PbSO_4$

$Mg_3(PO_4)_2$ $Zn(OH)_2$

Practice

Name the following ionic compounds:

$CaCl_2$, KBr , $FeCl_3$, $FeSO_4$, Na_3PO_4

Write the formula for the following ionic compounds:

lead (II) oxide, lithium chloride, copper sulfate, barium fluoride, zinc hydroxide