

Name: _____

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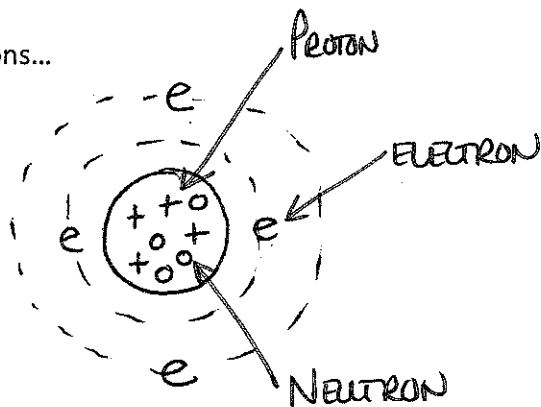
Class Period: Copy

Chemistry Test
Study Guide 2014

Atomic Structure

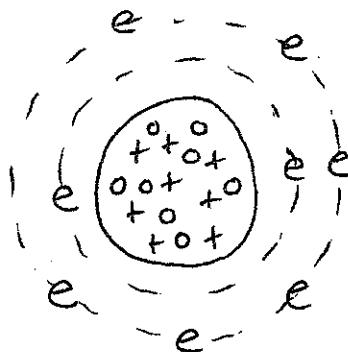
Use the drawing of the atom to the right to answer the following questions...

1. Label the protons, neutrons, and electrons.
2. Protons have a POSITIVE charge.
3. Neutrons have NO charge. -NEUTRAL
4. Electrons have a NEGATIVE charge.



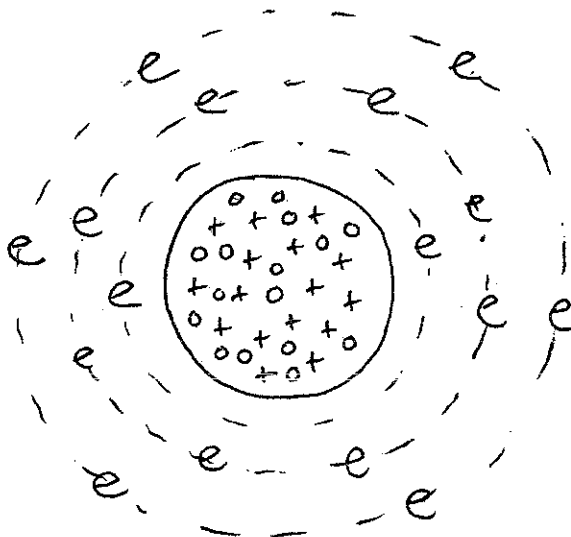
Use the drawing of the atom to the right to answer the following questions...

1. Number of protons: 8
2. Number of neutrons: 8
3. Number of electrons: 8
4. Atomic Number: 8
5. Atomic Mass: 16
6. Chemical Symbol: O



Use the drawing of the atom to the right to answer the following questions...

1. Number of protons: 16
2. Number of neutrons: 16
3. Number of electrons: 16
4. Atomic Number: 16
5. Atomic Mass: 32
6. Chemical Symbol: S



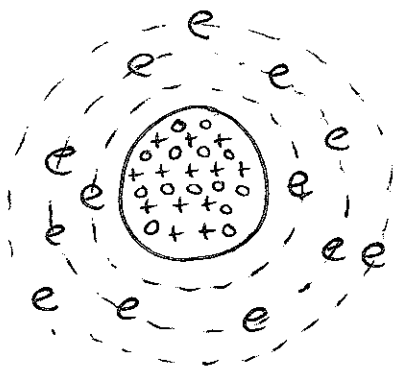
Use your periodic table to draw the following atoms....

1. Aluminum

P=13

N=14

E=13

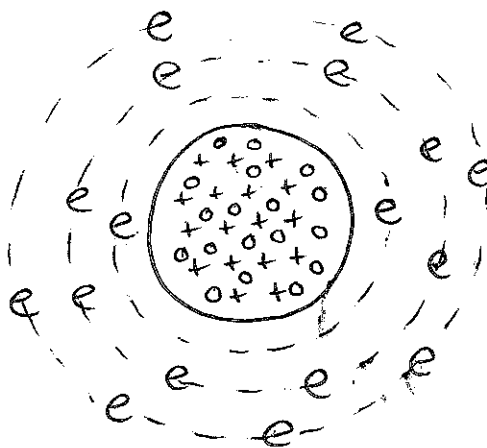


2. Chlorine

P=17

N=18

E=17

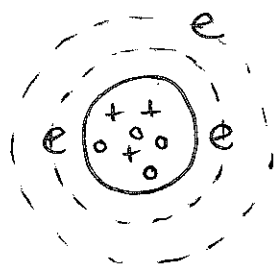


3. Lithium

P=3

N=4

E=3



Atomic Bonding

Use your periodic table to complete the chart below of the following atoms...

Atom	Dot Diagram	Gain or Lose?	How Many Electrons?	Ion Formed
Sodium	Na•	LOSE	1	Na ⁺
Chlorine	•Cl:	GAIN	1	Cl ⁻
Lithium	Li•	LOSE	1	Li ⁺

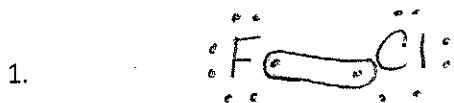
Electrons in the outermost energy level of an atom are called VALENCE electrons.

For an atom to become stable it can GAIN, LOSE, or SHARE these electrons.

If Aluminum loses its 3 valence electrons to become stable, what ion will be formed? Al⁺³

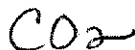
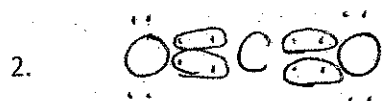
If Nitrogen gains 3 electrons to become stable, what ion will be formed? N⁻³

Use the drawings below to determine the type of bonding (Ionic or Covalent) and explain what is happening to each atom.



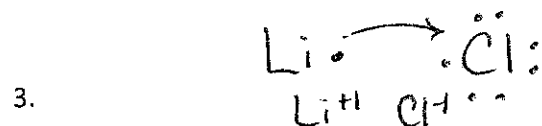
a. Type of Bond COVALENT

b. Explanation F IS SHARING 1 ELECTRON WITH Cl.



a. Type of Bond COVALENT

b. Explanation C IS SHARING 2 ELECTRONS WITH 2 OXYGENS.



a. Type of Bond IONIC

b. Explanation Li IS LOSING 1 ELECTRON TO BECOME A POSITIVE ION.

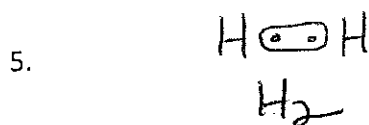
Cl IS GAINING 1 ELECTRON TO BECOME A NEGATIVE ION.
OPPOSITE IONS ATTRACT.



a. Type of Bond IONIC

b. Explanation Na IS LOSING 1 ELECTRON TO BECOME A POSITIVE ION.

Cl IS GAINING 1 ELECTRON TO BECOME A NEGATIVE ION.
OPPOSITE IONS ATTRACT.

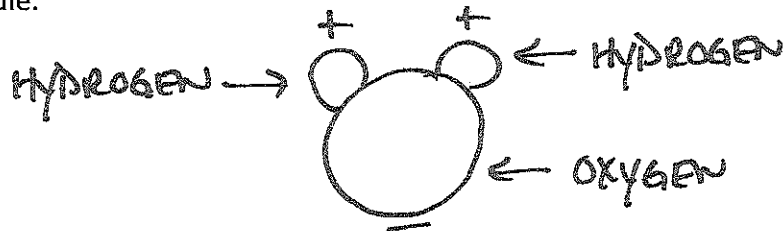


a. Type of Bond COVALENT

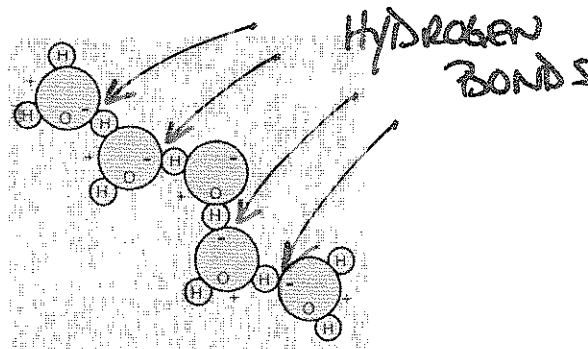
b. Explanation H IS SHARING 1 ELECTRON WITH ANOTHER H.

Section 2: Water and Solutions

1. Water is formed due to two atoms of HYDROGEN bonding to one atom of OXYGEN.
2. The bond that makes water is called a COVALENT bond. - SHARING E⁻
3. The chemical formula for a molecule of water is H₂O.
4. In the drawing below, label the hydrogen atoms, oxygen atom, and place the appropriate charges on the molecule.



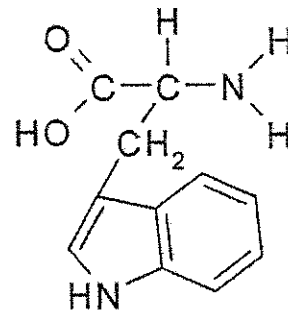
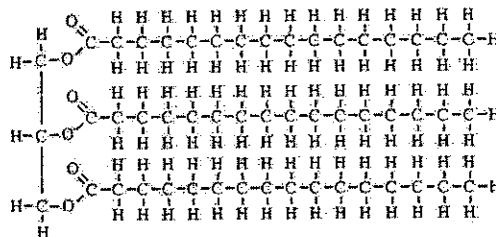
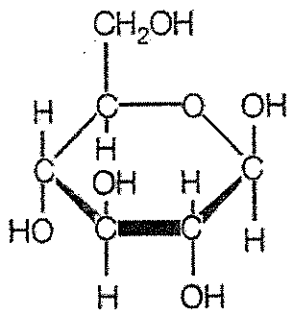
5. The shared electrons between hydrogen and oxygen are shared unfairly. These shared electrons spend more time at the OXYGEN end of the molecule.
6. Water is called a polar molecule because the oxygen end of the molecule is slightly NEGATIVE and the hydrogen end of the molecule is slightly POSITIVE.
7. Because water is polar it will bond to other polar molecules. This bond is called a HYDROGEN bond.
8. In the drawing below, label the hydrogen bonds.



9. When water is hydrogen bonded to other water molecules, the property of water occurring is called COHESION.
10. When water is hydrogen bonded to a different polar molecule (like those in a paper towel), the property of water occurring is called ADHESION.
11. pH is a measurement of how many hydronium and hydroxide ions are in a solution. The pH of pure water is 7. A solution with a pH lower than 7 is called an ACID and higher than 7 is a BASE.

Biomolecules

- List the three molecules most important to living organisms.
 - CARBOHYDRATES
 - PROTEINS
 - LIPIDS
- All of these molecules contain the atom CARBON because it has 4 valence electrons and can share electrons with up to four atoms at a time.
- For each of the figures below, label the carbohydrate, lipid, and amino acid (part of a protein)



EXAMPLE: $C_6H_{12}O_6$

CARBOHYDRATE

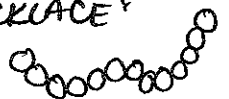
"RING STRUCTURE"

LIPID

"LONG CHAINS"

AMINO ACID

-ONE "BEAD" THAT MAKES A PROTEIN "BEADED NECKLACE"



Use the word bank below to match the descriptions with the biomolecule.

Word Bank		
a. carbohydrate	b. lipid	c. protein

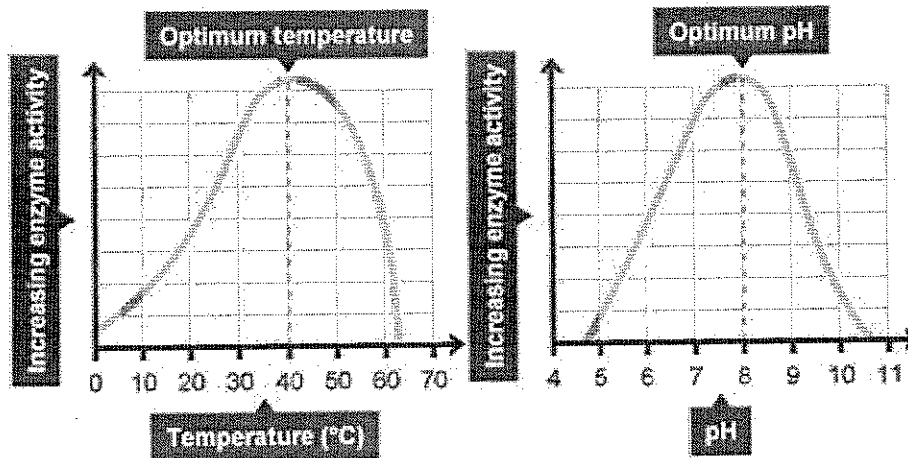
- C 1. Found in cheese and milk
- A 2. Always contains twice as much hydrogen as oxygen
- A 3. Provides immediate energy to your body
- C 4. Helps with growth and repair (construction workers)
- A 5. Found in soft drinks and fruit
- B 6. Examples include oils and fats
- B 7. Energy storage for your body
- C 8. Made of chains of amino acids

Section 4: Energy and Metabolism

Use the word bank below to match the descriptions with the correct term.

Word Bank		
a. chemical reaction	b. enzyme	c. reactant
d. product	e. activation energy	f. metabolism
g. homeostasis		

- c 1. the compounds that "go in" to a chemical reaction
- f 2. the sum of all chemical reactions in a living organism
- a 3. the process of breaking and reforming bonds between atoms
- d 4. the compounds that "come out" of a chemical reaction
- e 5. the minimum amount of energy required to start a chemical reaction
- g 6. chemical reactions help maintain stable internal conditions; this characteristic of life is called
- b 7. a protein that speeds up biochemical reactions



Refer to the graphs above to answer questions 8-10.

8. Enzyme activity can be affected by pH and TEMPERATURE because these factors can change the shape of the enzyme.

9. The optimum temperature for this chemical reaction is 40°C and pH is 8. Would a solution with this pH be an acid or a base? BASE