

## Chapter 6 and 7 Study Guide

### Reactions and Bonds

#### Multiple Choice:

- Copper is a good conductor of electricity because its electrons...
  - are positively charged
  - are free to move and flow
  - are shared between two atoms
  - are used by only one atom
- When two hydrogen atoms bond, the **positive** nucleus of one atom attracts the...
  - nucleus of the other atom
  - positive electron of the other atom
  - negative electron of the other atom
  - bonds of the other atom
- An ionic bond is a bond that forms between...
  - a non-metal and a non-metal
  - a metal and a metal
  - a metal and a non-metal
  - a metalloid and a metalloid
- In which type of bond do atoms share electrons?
  - Ionic
  - Covalent
  - polyatomic
  - metallic
- What happens in a chemical reaction?
  - Atoms are created
  - Atoms are destroyed
  - Atoms are removed
  - Atoms are rearranged
- Often atoms bond so that each atom will have...
  - an even number of electrons
  - an odd number of electrons
  - a filled outer energy level
  - more protons in the nucleus
- Covalent bonds are formed between...
  - ions
  - non-metals
  - metals
  - metalloids
- In a balanced chemical reaction, the total mass of the products...
  - increases from the mass of the reactants
  - decreases from the mass of the reactants
  - is equal to the mass of the reactants
  - changes every time you do the reaction
- Large molecules react more slowly than smaller molecules because they...
  - have less surface area
  - move faster
  - produce less heat
  - have more collisions
- Solid ionic compounds have very high boiling points because they...
  - have covalent bonds
  - have network bonds
  - have molecular bonds
  - have bonds between metals

11. Which of the following are properties of covalent bonds?

- A. Low melting point
- B. Low boiling point
- C. Weak structure
- D. All of the above
- E. None of the above

12. The forces that hold atoms and ions together are known as what?

- A. Nuclear force
- B. Chemical bonds
- C. Physical bonds
- D. electric currents

13. Each atom of water contains...

- A. one hydrogen and one oxygen
- B. one hydrogen and two oxygen's
- C. two hydrogen's and two oxygen's
- D. two hydrogen's and one oxygen

14. Which of the following would **reduce** the rate of a chemical reaction?

- A. placing the reactants in the freezer
- B. placing the reaction in a pressure cooker
- C. adding a catalyst
- D. increasing the surface area of the reactants

15. An enzyme is a special kind of catalyst that works to...

- A. Speed up a reaction
- B. Break down elements
- C. Inhibit a reaction
- D. Increase the number of atoms

16. A chemical equation is balanced by changing or adding what?

- A. reactants
- B. products
- C. coefficients
- D. subscripts

## True or False

\_\_\_\_\_ 17. A precipitate is a solid formed from two liquids.

\_\_\_\_\_ 18. Adding food coloring to water is a chemical reaction.

\_\_\_\_\_ 19. If atoms have a greater ability to collide then reactions occurs more quickly.

\_\_\_\_\_ 20. Bubbles forming is a clear sign of a physical change.

\_\_\_\_\_ 21. There are always the same number of atoms in reactants and products

\_\_\_\_\_ 22. Exothermic reactions absorb heat and cool the environment.

\_\_\_\_\_ 23. Breaking bonds never release energy.

\_\_\_\_\_ 24. Endothermic reactions would cause a thermometer to decrease in temperature.

\_\_\_\_\_ 25. The type of bonds determines the strength of a compound.

26. Describe 8 possible signs that a chemical reaction has occurred.

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

27. List 5 things that will speed up a reaction

- 1.
- 2.
- 3.
- 4.
- 5.

Fill in the blank with the correct word to finish the sentence.

Word Bank (not all words or numbers are used)						
1	2	3	Released	Absorbed	Collide	Color
Compound	Energy		Molecular	Ionic		Rate
	Reactions		Rearranged	Share		Take
Polar	Nonpolar		Combustion	Synthesis		Decomposition

28. A change of \_\_\_\_\_ is a sign that a chemical reaction is taking place

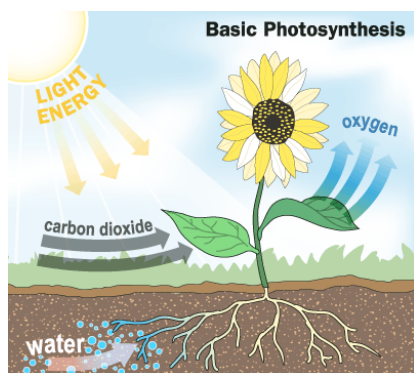
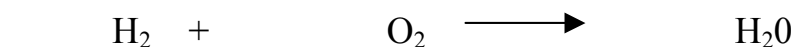
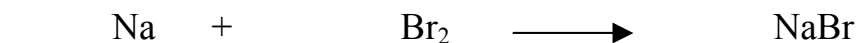
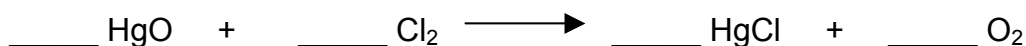
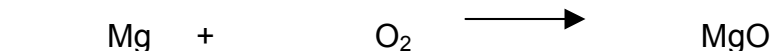
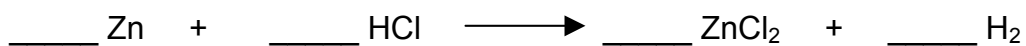
29. In a chemical reaction atoms are \_\_\_\_\_, but they are not created or destroyed.

30. In a state of equilibrium, a reaction and its reverse reaction occur at equal \_\_\_\_\_.

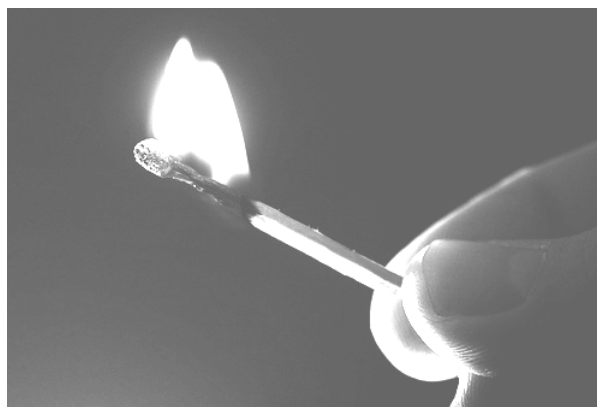
31. When elements combine they may form a \_\_\_\_\_ with very different properties from the atoms making it up.

32. The chemical formula  $H_2O$  means water has \_\_\_\_\_ hydrogen atom(s) and \_\_\_\_\_ Oxygen atom(s).

33. The boiling point of salt is very high because of its \_\_\_\_\_ structure.
34. When two chlorines bond they will \_\_\_\_\_ valence electrons to be more stable.
35. In a chemical reaction, energy is either \_\_\_\_\_ or \_\_\_\_\_ when the bonds are broken.
36. The kinetic theory states that molecules move faster with increased \_\_\_\_\_.
37. A \_\_\_\_\_ covalent bond shares electrons equally.
38. A \_\_\_\_\_ covalent bond does NOT share electrons equally.
39. In a \_\_\_\_\_ reaction, new bonds are formed when two substances react to make one.
40. In a \_\_\_\_\_ reaction, bonds are broken when one substance is made into 2 substances.
41. In a \_\_\_\_\_ reaction, bonds are broken when a substance reacts with  $O_2$  to produce  $CO_2$  and  $H_2O$ .
42. Use the space provided to balance the following equations...use only 1<sup>s</sup> and 2<sup>s</sup>



**Picture A**

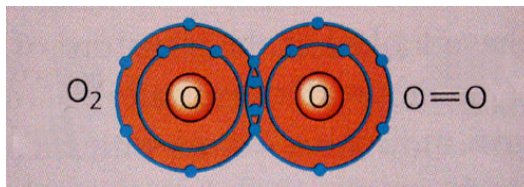
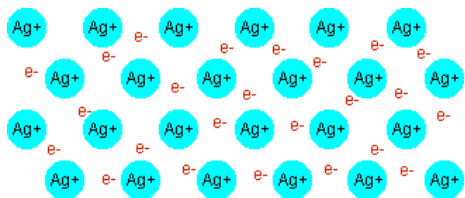


**Picture B**

43. Use the pictures above to complete the two statements.  
 Picture \_\_\_\_\_ is exothermic because it is releasing energy.  
 Picture \_\_\_\_\_ is endothermic because it is absorbing energy

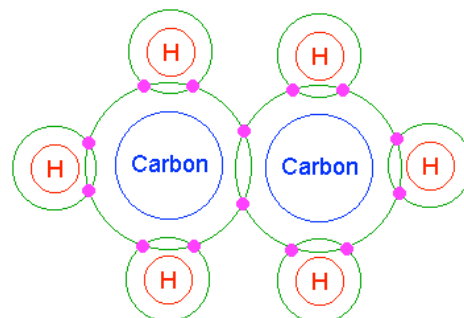
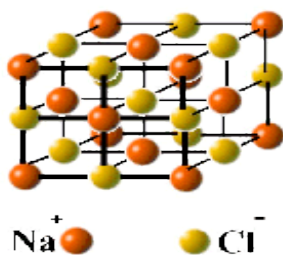
44. What type of bonds do the following represent?

**Ionic, Metallic, or Covalent-polar, Covalent-nonpolar**



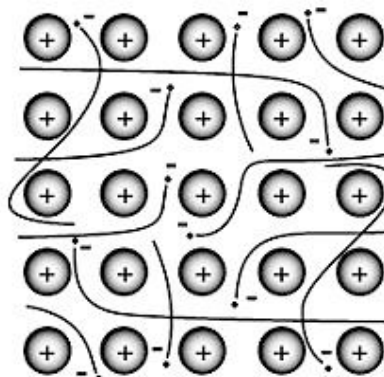
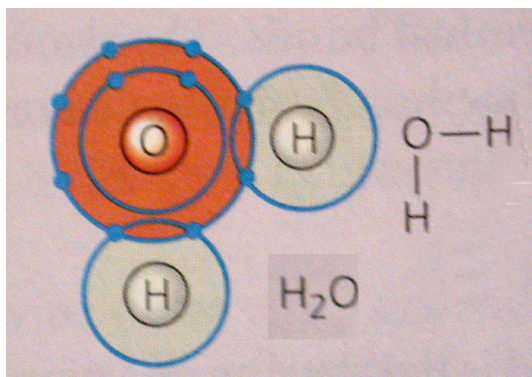
A. \_\_\_\_\_

B. \_\_\_\_\_



C. \_\_\_\_\_

D. \_\_\_\_\_



E. \_\_\_\_\_

F. \_\_\_\_\_

#### 45. Sort the following features of bonds into their correct bond types:

- |   |   |
|---|---|
| A) Between Metal & Non-metal                          | G) Solid at room temp.                          |
| B) Solid or Liquid don't dissolve in H <sub>2</sub> O | H) Shares electrons equally                     |
| C) Doesn't conduct when dissolve in H <sub>2</sub> O  | I) Usually liquid or gas at room temp.          |
| D) Dissolves in H <sub>2</sub> O                      | J) Conducts electricity when dissolved in water |
| E) Strongest Bonds                                    | K) Transfers electrons                          |
| F) Shares electrons unequally                         | D) Dissolves in H <sub>2</sub> O                |

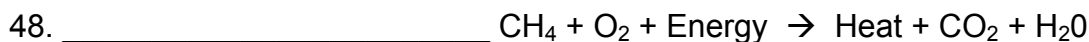
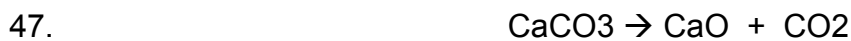
Ionic Bonds: \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Polar covalent Bonds: \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Nonpolar Covalent Bonds: \_\_\_\_\_, \_\_\_\_\_

#### Label the different types of reactions:

Decomposition, Combustion, Synthesis, Single Replacement, Double Replacement



53. Predict the product for the following equation (use double replacement)



54. What happens during a chemical reaction (list the 3 steps)?

- 1- Bonds are \_\_\_\_\_
- 2- Atoms are \_\_\_\_\_
- 3- New \_\_\_\_\_

55. Two students are trying to dissolve a chunk of chalk in acid, predict which person would win and **WHY (Justify answer)** with the following guidelines:

Person 1:

- 50 mL of hot acid
- Has one solid piece
- Able to stir it
- Can do 1 extra thing

Person 2:

- 50 mL of cold acid
- Breaks the chalk into pieces
- Starts 30 seconds before Person 1
- Can do 1 extra thing

Person \_\_\_\_ would win because...

56. How does a human get energy from food through digestion (a chemical reaction)?

The energy comes from ...